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FIVE CASES OF CEREBRAL SURGERY. I. AND II. FOR EPILEPSY FOLLOWING TRAUMA. III. FOR INSANITY FOLLOWING TRAUMA. IV. FOR CEREBRAL TUMOR. V. FOR DEFECTIVE DEVELOPMENT.

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IN this paper I report, with some observations, five cases of operations involving the brain, which have been done in the last eighteen months. These are all the cases operated on by myself in the Orthopædic Hospital, except that in addition to these, one case (microcephalus) has already been reported[1] and a second (probable tumor) is not yet terminated, and hence I shall report it hereafter. For most of the careful histories of these cases I am indebted to Dr. F. A. Packard.

I would suggest that in operations on the brain it is of great advantage to have a stenographer present at the operation, and so many surgeons now have their regular stenographers that this can often be done very readily. This is of especial value during the stimulation of the brain by the faradic battery, when the stenographer can instantly note and describe the exact point on the brain which is stimulated and the precise phenomena in face, neck, arm, leg, trunk, etc., that occur on such faradization. It is very difficult to write quickly enough all the details that are observed at such a time, and they are either lost or become confused, and, even if this does not follow, the operation will be seriously delayed. The stenographer can take such dictation instantly, together with memo-

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randa of measurements, etc., and possibly make a sketch of the convolutions exposed, with an accuracy which is greatly to be desired. Especially is this true at present, when the functions of such parts of the brain as are stimulated are as yet, in man at least, not so accurately determined as is desirable. The most correct measurements possible and all the observed phenomena are, therefore, of the greatest value, and should be minutely described.

The first two cases were both of epilepsy following trauma.

CASE I. *Traumatic epilepsy; operation; implantation of decalcified bone; recovery with partial integrity of bone, and no subsequent attacks for eight months.*—C. J., colored, aged about thirty-nine years. Her history is very indefinite, owing to her want of intelligence. She was sent to the Infirmary on October 8, 1890, by Dr. Merritt, of Easton, Md. She is married and has had eight children; four are dead—one with spasms, one with diarrhœa, one with marasmus, one, cause unknown. Three of the four living children are healthy. Family history otherwise negative and uncertain, except that one sister is weak-minded, and at times has to be kept in confinement.

In childhood she was playing on a cellarway when a window-sill fell from a high window and struck her on the left side of the head, and she remained unconscious for some time. No operation was done at the time of injury, although it was spoken of. Her first spasm occurred not long after the injury. In the first eleven years that followed she had but two attacks—six years after the injury and five years later. Then they began to be more frequent, and this frequency has been steadily increasing until now they are only a month or two apart, and sometimes she has two in one day. The character of the convulsions has always been precisely the same. They begin with flexing of the fingers of the right hand on the palm, followed by forced and extreme supination of the wrist. She then either lies down or falls down and screams. She loses consciousness completely, and knows nothing till she finds herself crying and the right arm moving in a spasmodic manner. She does not sleep after an attack, nor is there any paralysis of motion or disturbance of speech. She always has a severe headache, however, at the site of the former injury for a day or so. She does not bite her tongue. Once or twice she has urinated during an attack; no defecation.

Her general health was good until last winter, when she had influenza. Intelligence poor, but perhaps, excepting memory, no more so than usual. Between the attacks she is free from headache unless the site of the injury is struck. Hearing is good; smell and taste subjectively unimpaired. Has dyspepsia, sluggish bowels, no œdema, no cough. Menstruation regular.

Dr. de Schweinitz reports on the eyes: "Perfectly normal, oval discs, fundus of each eye healthy. Visual field for form normal. Color fields not taken."

Status presens: A fairly well-nourished colored woman. Face symmetrical; no facial palsy. Answers questions quite well. Tongue protruded straight. Arms symmetrical; is right-handed. Measurements of two arms practically identical. Dynamometer: R. 97.5; L. 118.

Knee-jerk on right side much exaggerated; on left, slightly so. Sole tap, R. marked, L. absent. Front tap, R. marked, L. obtained with difficulty. Achilles' tendon reflex marked on both sides. Plantar skin reflex absent on both sides. Gait natural. On standing with her eyes closed there is marked swaying, but she does not fall.

3.5 cm. (1⅜ inches) behind and 5 cm. (2 inches) above the external angular process, on the left side, is an abrupt bony elevation. Toward the median line, from and behind this, there is a marked depression of a roughly triangular shape, the apex pointing backward. The anterior border of this depression is much thickened and the superior border lies 4.5 cm. (1¾ inches) to the left of the middle line. The posterior extremity lies 1 cm. (⅜ inch) behind the left fissure of Rolando. The antero-posterior diameter of the depression is 5 cm. (2 inches), and its vertical measurement is 3.7 cm. (1.5 inches). The cranial index is 77.7 and the fissure of Rolando, therefore, runs at 70.3°.

On October 15th she had a convulsion, which is thus described: "She screamed several times for about thirty seconds, then fell to right side, and right hand became first convulsed, the fit involving first hands and face, and lastly the legs. Jerking of the head was most marked. The legs twitched slightly, then she crossed the left one over the right. There was no frothing. She seemed to be conscious and tried to speak, but could not utter more than one word. The duration of the fit was three minutes. She knew it was coming on, and grasped her right hand above the wrist. The pupils were equally dilated and responded to light just at the end of the attack."

Operation, October 29, 1890. The usual semilunar flap, with the convexity upward, was made, and the depression was exposed. The bleeding from the scalp was, as usual, controlled by hæmostatic forceps. The defect in the skull was found to be covered by a thin membrane, which allowed the pulsations of the brain to be plainly seen, and this membrane was slightly attached to the margin of the opening in the bone. The membrane was matted together with brain tissue and a little of the brain tissue was torn away in its careful removal. Two or three apparent cysts were opened in the removal of the membrane. During this part of the operation the face was drawn strongly to the left, the right eye being a trifle open. The muscles of the left side of the face moved at times, the angles of the mouth being drawn strongly upward, the grimace then slowly relaxing. The patient seemed not to be completely anæsthetized and was groaning. No movement of arm or leg on either side was detected.

At the posterior lower part in the opening of the skull the bone was apparently 1.5 cm. (⅝ inch) thick, thinning just in front of it to 3 mm. (⅛ inch) thick. It was found that a fragment of bone had been depressed and grown fast, and thus gave the impression of greatly thickened bone. The projecting fragment was removed by forceps.

The entire face continued to be drawn tightly upward during this manipulation, the mouth markedly so, while this was not so marked at the angle of the eye, nor was the brow markedly contracted. The brain at the bottom of the depression was of a dark-gray color, with a brownish tinge, evidently being disorganized brain tissue. The cerebral surface exposed was of concave shape, the depression at the deepest part measuring 1¼ cm. (½ inch). The edges of the opening in the skull were irregular as well as thickened, and were removed by the rongeur for-

ceps till it measured 6.3 cm. (2.5 inches) antero-posteriorly by 3.8 cm. (1.5 inches). At the first bite of the rongeur forceps the face on the left side became markedly contracted, while on touching the dura the contraction became much more marked. The right eye was a little open at the same time. This sensitive point on the dura was 7.3 cm. (2⅞ inches) to the left of the middle line and the same distance back of the external angular process. When this point was faradized the left side of the face became contracted, the right thumb persistently twitched, and the respirations became longer. The same effects were produced by faradizing the bone in the neighborhood. On faradizing the brain cortex for a very brief time just below the upper margin in the middle of the opening there was marked adduction and abduction of the thumb followed by extension of the fingers of the right hand, with clonic convulsive movements (flexion and extension) of the whole right arm. These movements persisted for nearly a minute after the stoppage of the current, and resembled the epileptic attacks. The point touched on the brain was 5.8 cm. (2¼ inches) to the left of the middle line, and 7.3 cm. (2⅞ inches) from the external angular process.

With a knife a circular incision was then made in the brain substance, including the point which had been stimulated, without producing movement of any part. The diseased cortical matter and some underlying white matter were removed with a sharp spoon until apparently healthy white matter was exposed. No phenomena were observed during this removal, the left face even gradually relaxing during the manipulation. The pulse was now 78. At this time the right eye was directed upward and outward, the left in a parallel direction, but to a less extent. On pinching the scalp with the forceps the same drawing up of the face took place as was noted when the battery was applied on the dura.

The battery was now applied to the white matter lying beneath, which had been exposed by the removal of the gray matter, and as nearly as could be ascertained, exactly below the point which had produced the brachial monospasm. This caused flexion of the ring and little fingers with abduction of the hand and flexion of the elbow, the phenomena stopping immediately upon the removal of the electricity instead of continuing and developing into a typical attack, as they had done before. There was no movement of the right face during the electrical or other stimulation, but there was constant contraction of the left face.

After all bleeding had been controlled and a small rubber drainage-tube inserted, a piece of decalcified tibia from a bullock, perforated by several openings, was fitted accurately to the defect in the skull, with the exception of a notch for the exit of the drainage-tube. The decalcified bone-plate was stitched to the scalp with chromicized catgut, superficial horsehair drainage inserted, and the scalp sewed with interrupted chromicized catgut sutures. A gauze dressing with rubber dam was applied.

On the day following the operation flexion and extension of the right hand were entirely lost in both fingers and wrist. She could prevent the hand from falling in extension, but not in flexion; that is, the flexors were entirely paralyzed, the extensors only partly so. Flexion and extension at the elbow were slight but present. Movements of the shoulder also present, but paretic. Right leg unaffected. Left angle of the mouth elevated slightly. Movement present in all face muscles;

eyelids could be closed. In speaking, the left side of the mouth was drawn upward slightly more than the right.

On the second day there was no area of anæsthesia. If anything, a pin-prick caused more pain on the right than on the left hand. There was no difference in distinguishing the two points of an æsthesiometer, being on dorsum of hands 2.5 cm. (1 inch), dorsum of second joint of fingers 7 mm. (¼ inch), outer side of forearms 6.7 cm. (2⅝ inches), outer side of upper arms 5 cm. (2 inches).

On the fifth day the drainage-tube was removed, and on the seventh the horsehairs and the sutures were removed, the wound being entirely healed. On the eighth day she was out of bed. On the tenth pulsation was still evident over the old defect in the skull, the lower half of the flap feeling soft, the upper half being more firm. There was slight improvement in the movement of the right shoulder, but not in the elbow, wrist, or fingers. The stitches through the implanted bone were removed on the eighth day.

On the nineteenth day she moved the fingers for the first time, the index finger leading, with slight motion in the thumb and middle finger. There was slight extension at the wrist. She stated that while gaping a few days previous to this the fingers had become markedly flexed. On the twenty-third day she left the hospital and went home, moving the three radial fingers more freely, but the two ulnar ones not at all. Wrist barely movable, especially in flexion; elbow could be almost entirely flexed or extended, but slowly and with difficulty. The decalcified bone had become concave in its lower part over an area the size of the tip of the index finger, but it was apparently secure.

June 11, 1891 (eight months). There have been no attacks since the operation, and her general health and mental condition are far better than before. Dynamometer: R. 25, L. 50; but for practical purposes the right hand is far more useful than would be judged by this difference. Its movements are complete in range, but lack power, and she cannot yet cut her meat at table. It is, however, constantly bettering. The trephine opening is well closed with firm tissue, but in part at least it yields to firm pressure to such a degree as to make it doubtful whether this is bony or not. It, however, affords an excellent protection to the brain.

Case II. *Epilepsy following a trauma; operation; implantation of sheep's bone; recovery, with subsequent necrosis of implanted bone, but only three attacks in nearly six months, each caused by the operations.*—G. H., aged twenty-three years, was sent to the Orthopædic Hospital November 13, 1890, by Dr. H. M. Schallenberger, of Rochester, Pa. His mother died of consumption, aged forty-two; his father of renal dropsy. One brother died of consumption, aged twenty-eight. Otherwise the family history is good. While teething he had an unknown number of convulsions, but no others prior to his accident. In 1874, at the age of seven years, he was kicked on the head by a horse, and remained unconscious for a few hours. Trephining was soon afterward begun, but his physician says that it was not completed, owing to shock. Three pieces of bone, however, were removed. At least one had penetrated the brain for an inch. His recovery was slow and he was delicate for a year or more. So far as he remembers, his first fit was in 1876, two years after the accident, and his attacks have always been of the same character throughout. The attacks eventually became more frequent,

being about once a week. After fourteen years of age they became less frequent, only coming about once a month; this not being the result of medicine. For the last six years they have only occurred about once in three months, except that in March last, without any apparent reason, unless possibly due to his having sat over a hot fire, there were three attacks in two days. His last fit was about the middle of last September.

There is no exciting cause for them, unless possibly coming into a warm room with a close atmosphere, and once or twice excitement has caused them. He has only had one attack during the night. He has often been struck in the neighborhood of the scar, though not on it, without producing any fit. At the beginning of an attack he has a confused feeling in his head, not lasting long enough usually to give him time to sit down; once he had time to cry "Look out!" Twice he has run a short distance during the premonitory mental confusion. Loss of consciousness comes on quickly without any cry. He usually falls forward and frequently injures his face; he always bites his tongue. He does not know that any part of the body is first or chiefly affected. There is no urination or defecation during the attacks. After a sleep of about an hour, followed by a weak and drowsy feeling and slight headache for a couple of hours, he is able to work the rest of the day.

Status presens: General health is good, although he appears to be not well nourished. His skin is pale; appetite good; bowels regular. His memory, he thinks, is not so good as formerly. No pain anywhere. Eyesight is not very good, but no worse than it has always been. His hearing is good. Dr. de Schweinitz reports that he "has a high grade of astigmatism, probably mixed. Pupils and external ocular muscles normal; discs rather gray-red in color, with some contraction of right visual field. The contraction is concentric and of no localizing importance. Pupils equal and react well to light." There is no facial palsy. Tongue clean and protruded straight.

Dynamometer: R. 153, L. 123. He is right-handed. No increase of biceps, triceps, or wrist tendon reflexes on the left side; wrist tendon reflex on the right side increased; others normal. No increase of muscular irritability in arms. Knee-jerk greater than usual, but equal on both sides. Ankle-clonus absent on both sides. Achilles' tendon reflex equal on both sides. Æsthesiometer: On dorsum of hands, two points felt at one inch on both sides; on dorsum of feet, 1½ inches, on both feet.

His head is of a natural shape and symmetrical, excepting for the scar. In the right parietal region is a large stellate scar, approaching an anchor in shape, the arms of the anchor being below and forming a shallow crescent with the convexity downward. At the junction of the pole of the anchor and the anterior arm there is a depression of 3.9 cm. (1½ inches) in the long diameter (obliquely upward and forward) and 2 cm. (¾ inch) in short diameter (transversely). The depression is 1.4 cm. (½ inch) deep. The edges of the depressed area are well defined and rounded off, with no sharp points. There is no pulsation to be seen or felt. The floor of the depression is hard and resistant. There is slight tenderness on pressure over the scar.

The longest portion of the scar (obliquely) measures 5 cm. (2½ inches), the short arm 2.5 cm. (1 inch). The centre of the depressed area is 9.6 cm. (3¾ inches) from the middle line and the same distance

back of the external angular process on the right side. The cranial index is 79. The anterior extremity of the depression just touches the line of the Rolandic fissure at a point 8.3 cm. (3¼ inches) from the median line.

Operation, November 21, 1890. A semicircular flap was reflected, exposing the defect in the skull. In loosening the flap from the margin of this defect considerable cerebro-spinal fluid escaped *per saltum* synchronously with the pulse. The loose tissues filling the opening seemed to be more or less cystic. At least two or three ounces of the fluid escaped. A small loose spicule of bone was engaged in the membrane or tissue filling the opening. This tissue was next dissected away. The edges of the opening were greatly thickened, so that the squamous portion of the temporal was almost a quarter of an inch thick. The diploë in the parietal border of the opening was so marked that the bite of the rongeur was perceptibly divided into two distinct stages, one for each table. The thickened bone around the opening was bitten away till the opening measured 5 cm. (2 inches) obliquely antero-posteriorly, and 2.8 cm. (1⅛ inches) in a transverse direction. No dura covered the brain at the site of the injury. The brain tissue was now exposed. A moderate amount had adhered to the tissue filling the opening and had been torn away with it. The remaining portion was normal as far as eye and touch could perceive, and none of it was removed. One small branch of the middle cerebral was ligated. The convolutions could not be recognized, as they were to a large extent fused together.

The right hemisphere failed to fill the cavity of the skull to such an extent that not only was the surface of the brain depressed opposite the opening, but a space existed between the right hemisphere and the dura at least one-third of an inch across, so that one could look under the edge of the bone two and a half inches, away up toward the falx.

At this point my assistant, Dr. W. J. Taylor, removed a piece of bone from the skull of a young sheep which had been brought to the hospital and killed at that moment. The piece selected about corresponded in curvature to the curvature of the patient's skull, and the edges of it were bitten away by the rongeur forceps so as to fit the opening accurately. From the time this piece was removed from the sheep's skull till it was inserted in the patient's it was kept in a bichloride solution, 1 to 2000, at 100° to 105° F., and most of the trimming of this bone was done while it was immersed in this warm solution. Dr. Taylor, of course, used the same antiseptic precautions in his operation on the sheep as I did on the patient.

Two points were bitten out of the piece antero-posteriorly to allow for the passage of horsehairs for drainage, and two openings were made, not only for drainage, but also to allow the passage of two sutures, by which it was sewed to the flap of the scalp, and which were tied externally.

Before the opening was closed the brain was faradized at the following points: First, 7.1 cm. (2¾ inches) to the right of the middle line; 2.5 cm. (1 inch) behind the bi-auricular line. Second, 7.6 cm. (3 inches) to the right of the middle line, and 3.8 cm. (1½ inches) posterior to the bi-auricular line. The current was more than strong enough to move my own muscles, but no phenomena were observed.

The wound was then closed and the usual dressings applied, the gauze being of the strength of 1 to 2000.

In view of the large cavity between the skull and the brain I directed that he should lie with the right side of his head down, so that the blood should not accumulate in this cavity, but escape readily.

December 13*th* (22d day). On the night of the operation he had a severe and prolonged attack for nearly three-quarters of an hour, and ten days later, when terrified by a patient in the ward, who threatened to attack him, he had another fit, but only a slight one. Since then he has had none.

The drainage-tube was removed at the end of forty-eight hours and the horsehairs at the end of five days. For a week after the operation I dressed the wound daily, for the reason that a large amount of bloody serum accumulated between the flap and the bone, as was easily determined by palpation. This separated the bone from the flap except at the two points of suture and the area immediately about them, and, of course, accumulated under the bone between it and the brain, and caused me great anxiety lest the bone, being separated from its blood-supply, should undergo necrosis. Each day I was able gently to press out the fluid and bring the flap down to the bone, and as soon as I did so I could readily determine that the sheep's bone was not fast to the rest of the skull. At the end of a week the serum gradually ceased to accumulate. At the end of two weeks the bone was still slightly loose. I have not examined it between December 6th and to-day, when I found it, as far as gentle manipulation could determine, absolutely firm. The wound itself healed without trouble.

17*th* (26th day). He goes home to-day. In examining him yesterday I thought I detected a slight crepitus between the piece of sheep's bone and the skull. The external wounds have healed and he looks sound and well. He has no pain and has had no further attacks.

January 15, 1891 (2 months). He writes that a few days ago a small reddish blister appeared on the old scar. There is a slight bloody discharge from it daily. There is no pain, swelling, nor soreness. His general health is good.

April 25 (5 months). On his return to the hospital a few days ago I found over the site of the former operation a small opening in the scalp, with bare white bone exposed. The edges of the skin were blue and undermined with a small amount of pus, which was exuding. Under ether the edges of this opening were cut away, and on making a slight crucial incision through them the edges of the dead bone were reached, and it was easily removed. The piece of sheep's bone, which had originally been 2 by 1½ inches, had nearly disappeared, and the small fragment that I removed was rather less than half an inch in diameter both ways. Its edges were worm-eaten and soft. Underneath it was a distinct membrane in almost all respects resembling the dura. It was not opened, but by touch showed that under it was apparently a fluid. The wound was then wiped out with pure carbolic acid and dressed with ordinary bichloride gauze.

May 16 (21 days after second operation). The night of the operation he had a severe attack, since which time he has had none. The wound has healed readily excepting a very small area, scarcely the size of a pea. He is to go home in two or three days. He tells me that he feels immensely better than he did when he had the constant irritation of the gradually disintegrating bone. I have advised him to change his occupation, in order to have less stooping and lifting, either of which causes him considerable annoyance.

REMARKS.—These two cases suggest several points of importance. First, that in injuries of the brain immediate surgical interference may prevent the deplorable consequences which may arise, of which these two cases are illustrations. Of course, these particular accidents occurred at a time when surgeons were not equal to such interference; but they point out what the proper method of treatment of such cases should be in future. After wide and careful shaving and disinfection of the entire wound, not only the soft parts, but also the bone should be properly trimmed; and to this I would add that the lacerated brain substance should be removed, for experience is accumulating to a large extent to show that the scar tissue resulting from laceration is a very fertile source of epilepsy and other troubles, far more so than the scar which results from a clean incision in the brain tissue. Of course, no needless incursion should be made into sound brain tisssue, but better some of this, I believe, than to leave lacerated cerebral tissue. Even if some sound tissue be removed and paralysis follow, this will be only temporary; for after such excisions I have invariably found that the function has been restored in time, and generally nearly to the normal.

Secondly, if the dura be extensively lacerated, the lacerated portion should also be removed for like reasons. I would suggest that its place should be supplied from the pericranium by taking a considerable piece from the under surface of the flap of the scalp and sewing it to the dura, thus closing the gap. In doing this the osteogenetic (under) surface should be turned uppermost, so that if any bone should form, it should not grow downward toward the brain, but upward to fill the gap in the bone. A few interrupted sutures at the margin will fix it well in place. It will serve another important purpose also, namely, by closing the gap in the dura by early adhesions it will prevent the tendency to a fungus of the brain, so marked in every case where there is any considerable gap in the dural membrane, especially if there has been incision or laceration of the brain tissue. Since this idea occurred to me I have only had one opportunity of testing it, in a case operated on over three months ago at the Jefferson College Hospital. The piece of pericranium was cut entirely loose, turned downside up, and sewed to the dura, filling up the gap left by the removal of some of the dura, and up to the present time it has perfectly retained its vitality.

Thirdly, the question of immediately closing the gap in the bone by decalcified bone-plate. I do not know of any case at present in which this has been done as a primary step to remedy the defect in the bone tissue at the time of the accident. It seems to me, however, a very reasonable proposal, with probably only one serious drawback. In order that such a bit of decalcified bone shall retain its vitality, it is very essential that the wound shall be absolutely aseptic, and, of course, in a wound produced by an accident this is difficult to insure. On the

other hand, if the wound cannot be made aseptic the insertion of the bone will not increase the danger to the patient. I think, therefore, that the attempt to close the gap in the skull by means of such a procedure should at least be attempted. If the bone survives it is a clear gain. In both of the cases just reported I made a secondary attempt to close the opening, by different processes, in the two cases. In the first case I inserted decalcified bone after the manner Senn has advised, and with a very happy result, both as to the survival of the bone and the health of the patient. The facility with which this can be done is far superior to the transplantation of bone from an animal, for we can always have such decalcified bone in an antiseptic solution in a jar, ready for an emergency; whereas an animal cannot be so readily secured. Moreover, it requires fewer assistants, for there is but one operation to be done instead of two—one on the patient and one on the animal—with equally strenuous antiseptic precautions. As a minor point, also, it is far less expensive.

In the second case I filled the gap with a piece of bone from a sheep's head. Had the case run a typical course I think success would have attended the effort, but it was a most unfavorable case for such a trial. First, because the brain tissue did not fill the cavity of the cranium, and there was a hollow underneath the transplanted bone. This hollow was necessarily filled up by blood-clot of considerable size. Had the brain tissue and the bone been in contact I think the chances of the survival of the bone would have been better. Moreover, the large accumulation of serum which took place between the transplanted bone and the flap separated the bone for the greater part of the time during an entire week from the flap of the scalp, and thus both on the under and upper surface the transplanted bone was cut off from its blood-supply, excepting at the slight points of contact where the sutures passed through the piece of bone and the scalp. That it should apparently have survived for three months, and then, with disintegration of the bone, attended with suppuration, should have produced no endocranial mischief, I consider a very encouraging fact as to future attempts. I have had no opportunity to try the novel suggestion of Fränkel, which has been carried out by Hinterstoisser and Fillerbaum, to fill such openings with a celluloid plate. They state that it has been done three times with success (*Wiener med. Presse*, Jahrg. xxxi. No. 42). Nor have I yet tried König's method of chiselling loose the outer table of the bone along with the flap of scalp, leaving this attached by its base, and swinging it around to close the defect, while the site of the displaced osseo-cutaneous flap is covered by a skin-graft by Thiersch's method.

Fourthly, as to the results so far as the epilepsy is concerned, the time is as yet too short to give any definite opinion as to permanent results, but yet thus far the improvement has been very manifest.

Fifthly, can we determine by faradism whether the brain tissue, which to the eye and touch seems normal, is really diseased or not? This is a question I am somewhat disposed to answer in the affirmative, although as yet I do not feel at all sure of my ground. My reasons for this possible belief are as follows: When the current is applied to a normal centre in the motor area and the electrode immediately removed, we obtain merely a contraction of the muscles represented at the point of such faradization, the muscular contraction ceasing upon the removal of the electrode, and also being limited to the muscles represented in this area. In Case I. it will be observed that when the current was applied for a moment to the *diseased* tissue a *typical epileptic fit* was produced, following the march of those which had been observed prior to the operation, involving other muscles beside those represented at the immediate point of the cortex which was stimulated, and continuing for half a minute or a minute after the electrode was removed. This same phenomenon I have observed in other cases. It is, however, also true that in some cases of focal epilepsy in which presumably the cortex is diseased, when the area is stimulated no such fit is produced. Whether there be any significance and value in the production of such a fit, such as the above question suggests, I do not know. I submit it for further observation and judgment.

Case III. *Trephining for delusional insanity following trauma; temporary improvement.*—T. N., aged forty-four years, German; mining boss. Family history negative; no insanity. Syphilis denied. Has been a drinking man, but has enjoyed good health until twelve years ago, when he was thrown from a horse, striking on the top of his head. No immediate serious symptoms followed, but after a time he began occasionally to hear imaginary voices, particularly when excited after drinking. Seven years ago (five years after the prior accident) he was badly beaten by some laborers, one of the injuries being a severe scalp wound and injury to the right parietal bone, together with other cuts in the scalp. He was taken to the Drifton Hospital, and was perfectly rational, but after two or three days became delirious from erysipelas. After a month's time the wound was healed. While in the hospital he had some delusions as to hearing. These continued after he left the hospital, and in January, 1890, they became very marked, so that he would sometimes leave his work to meet an imaginary person. These delusions last July culminated in an attempt at suicide. An imaginary voice told him that he was about to be killed by someone who was pursuing him. Another voice said to him, "Don't let them kill you, but do it yourself." Accordingly he procured a revolver and shot himself between the third and fourth ribs near the nipple line of the right breast, with a 38-calibre ball. The ball was extracted at the angle of the scapula.

He was again admitted into the Drifton Hospital, suffering from traumatic pneumonia and delusions. The wound entirely healed, but his mental condition remained unchanged. He could often foretell an attack by a peculiar headache which preceded the delusions, together with insomnia and refusal to eat. Delusions of sight were also present.

The patient was admitted to the Orthopædic Hospital and Infirmary for Nervous Diseases October 2, 1890, under the care of Dr. Sinkler, who kindly asked me to see the case with him, and to whom and Dr. Packard I owe the history. His physical condition at that time was good, but he complained of constant headache, especially in the right parietal region at the cicatrix. He had an anxious expression and heard voices constantly. No delusions of persecution. He was quiet and docile, and for the most part sat alone in the corner of the ward. On shaving the head a stellate scar was discovered over the posterior and upper angle of the right parietal bone; a depression in the skull can be felt through the scar. There were several other small scars on both sides of the scalp, but none of any great apparent importance.

The patient is right-handed. Dynamometer: R. 80, L. 90. Left hand steady, but right shows a tremor on squeezing the dynamometer. Dr. de Schweinitz examined the eye-ground and found it perfectly normal. Knee-jerk slightly exaggerated on both sides; station good. There is no word-deafness, word-blindness, aphasia, or agraphia.

Professor Cattell, of the University of Pennsylvania, kindly examined the patient, and made the following report: "He did not show an abnormal condition as regards sensation, movement, speech, or intelligence, although these all seemed to be somewhat subnormal. No difference in sensation areas, discrimination of weights, or pressure causing pain, was found in the two hands. Dynamometer pressure was, however, weaker with the right hand than with the left, and was accompanied with more tremor. Equal pressure was felt, greater on the scar and on the left side of the scalp than in the median line and on the right side, and about half the pressure caused pain at the former points as at the latter."

After a consultation of the staff it was decided to do an exploratory trephining.

Operation, October 17, 1890. The scalp was adherent to the skull under the cicatrix, with a marked depression 1 cm. ($\frac{3}{8}$ inch) in length and 3 mm. ($\frac{1}{8}$ inch) in depth. A one-and-a-half-inch trephine was applied at this point. The skull was quite vascular. The disc of bone removed was rather thin, but the under surface appeared normal. The bone was thickest at a point corresponding to the scar and the dura mater was more firmly attached at this point than elsewhere. The dura appeared normal. The brain did not bulge when the dura was opened, but appeared somewhat flattened at a point corresponding to the thicker part of the button of bone. The pia was somewhat œdematous. Several white patches were observed in the course of the veins. There were no adhesions on the under side of the dura, and passing the finger under the dura revealed nothing abnormal. The dura was therefore closed with interrupted sutures and the flap of scalp sutured in place. The button of bone was not replaced. A small cicatrix over the right parietal bone, three inches above the ear, was also excised. The bone was normal underneath.

The patient made an uneventful recovery, and got up in two weeks after the operation. The pain in his head was very much less, and he did not hear voices, nor did he have any other delusions after the operation. Discharged November 16, 1890. He returned home, and on December 1 was reported in very good condition, being considered by his wife and employer much more rational than he had been. He was able to do some light work.

May 28, 1891. Mr. Miller, Superintendent of the Drifton Hospital, informs me that he did admirably for some weeks, but about the 1st of May he left home, intending, he said, to go to the old country. As he has not been heard of since, and took a revolver with him, it is to be feared that his mental condition was as bad as ever.

REMARKS.—This case seems to be a good example of at least temporary good results achieved in some obscure functional diseases of the brain by exploratory trephining. Very possibly the slight pressure on the brain by the thickened bone or the irritation in the bony cicatrix itself, as well as the cicatrix in the scalp, may have been the cause of his marked delusions, so marked as to lead him to an attempt at suicide. But the resulting good was of very short duration.

CASE IV.—E. C. P., aged fifty-six years, American. Father died young from inflammation of the bowels. Mother died at eighty from debility. Patient is married and has four healthy living children. He had the ordinary diseases of childhood. There is no history of exposure to the sun. He has been subject to gastric disturbances. With this exception he has been entirely well until the onset of his present trouble. Syphilis denied.

Twenty years ago he fainted while in a hot room and struck his head against a cuspidor, receiving a scalp wound, which healed promptly. From the age of fifteen until the age of forty-six he was a jeweller, but for the last ten years he has been doing clerical work.

In May, 1889, his present illness began with pain over the eyes, most pronounced over the right side, and uninfluenced by any known circumstances. At first it was intermittent and of moderate intensity. This headache was the only symptom until August, 1889, when he had a spell of nausea for a week, and was compelled to remain in bed for three weeks. The headache was much intensified by this attack. While in bed he had several attacks of vomiting without retching. This was the first of a series of such attacks, after which all his symptoms were intensified and new ones were manifested. While in bed it was for a time noticed that he had difficulty in selecting words—for instance, asking for a plate when he wanted a drink, speaking of his pillows as ribbons, frequently interchanging yes and no. He seemed to know that the word used was wrong, and recognized the proper word when suggested to him, although it could not be ascertained whether he himself was able to say the word suggested. This aphasia was present for three or four weeks, but then passed away, and was not noticed again till after Christmas, 1889. On first getting out of bed he had considerable giddiness, but never fell. Change of posture markedly increased the giddiness and headache.

Early in August his memory and vision began to fail. He remarked that he could write short words, but not long ones, owing to the fact that if long he could not see both the beginning and end of the word. At the same time he noticed that he was unable to see people or objects approaching him from the right side. He was able to walk with closed eyes, but could not readily touch the tip of his nose with his right forefinger, his eyes being closed. On getting out of bed after his first attack it was noticed that his right arm and leg were slightly paretic.

This has persisted to a greater or less extent ever since. After the first attack his appetite became ravenous and for a week he rapidly gained strength. At the end of a week after this attack he vomited his breakfast immediately after eating it, and the frontal and occipital headache, which had remained severe from the onset of his first attack, was much intensified, and he was compelled to go to bed again on account of this. The vomiting only appeared on the first day, but the nausea and headache continued. After the recovery from this attack his condition remained about stationary until October 25, 1889, when he began to improve, and was able to walk alone in the street, though he lacked confidence in himself, owing to the disturbance of vision and a slight dragging of the right leg.

December 1, 1889, he had an attack of nausea and headache, lasting three days, and after a lapse of ten days he had another. During the last attack some jerking of the right arm was noticed when he used it, as in brushing his teeth, and slight aphasia reappeared. His bowels were quite constipated. There was no weakness of the sphincters until after his admission to the hospital, when he had nocturnal incontinence of urine. No shortness of breath or palpitation; no œdema; no cough. Sleep has been profound, but no somnolence. No emaciation.

He was admitted to the Orthopædic Hospital January 3, 1890, under the care of Dr. S. Weir Mitchell, who kindly asked me to see the case with him, and to whom and Dr. Packard I owe the history.

Status presens, January 3, 1890: A spare man, with gray hair, blue eyes, and sallow skin; temporal arteries somewhat tortuous and the walls slightly leathery. No arcus senilis. There is no scar on the head; no tenderness to mediate or immediate percussion. No difference of percussion noted except that due to the varying thickness of the bone. Tongue clean and protruded straight. Breath offensive (possibly due to taking KI?). Examination of chest and abdomen negative. There is slight rigidity of the posterior cervical muscles. Dynamometer: R. 75, L. 62 on one occasion, but on another, and probably more accurately, R. 75 and L. 85.

On exertion there is coarse, rapid tremor of the hands and arms. The outstretching of the arms causes a bilateral equal rapid tremor. When at rest there is no tremor. The superficial abdominal reflexes normal. Knee-jerk exaggerated on left side and somewhat more on the right. Ankle clonus present on both sides, most marked on the right. No patellar clonus. Muscle reflexes poorly developed. The wrist, biceps and triceps reflexes could not be elicited. With eyes closed he cannot touch the tip of his nose accurately with either forefinger. Intellect sluggish; answers slowly and in an abstracted manner, seeming to brighten up at times by a great effort. No alteration of hearing, taste, or smell.

When shown a pencil he called it "a pad from a table of envelopes," and later he called a key a "pad," although he both saw and handled it. Afterward when shown it again, he named it aright, but when shown a hairbrush called it a "key." He was told its proper name and again shown the key. When asked now what he would use the key for he said that "he would brush with it." His wife (with her eye-glasses on) then came in front of him, and when he was again shown the brush he said that it was "what is usually known as eye-glasses." On another trial he called the key a "penknife," and when asked whether he would

use it to open a door said "yes." When asked to name it, he called it a "key-knife." Evidently the last preceding idea was carried over to the next object seen.

The letters A B were printed plainly on a piece of paper. He could not name them at first, but was evidently not paying attention. On a second trial he named and pointed to B, but also called A "B." He was then shown B again, and called it "C." When a key was shown him he could not name it, nor could he do better when the letters K E Y were shown with it, or by themselves. A pair of scissors and a piece of paper were handed him, and he was able to cut the paper properly with the scissors.

Dr. de Schweinitz reports as follows on the eyes: "Double optic neuritis. Discs swollen + 5 D. Some fresh hemorrhage at the outer side of right disc. Right lateral hemianopsia. Wernicke's pupillary reaction absent. No paralysis of external eye muscles."

Diagnosis: Cerebral tumor in the parieto-occipital lobe, and most likely in the angular and supra-marginal gyri, with pressure on the cuneus.

On shaving his head four scars were found, the first 1.9 cm. (¾ inch) above the inion, beginning at the middle line and running obliquely upward and forward for 1.9 cm. (¾ inch). Another scar, corresponding to the first, was present on the other side. 12.5 cm. (5 inches) in front of the inion, 1.3 cm. (½ inch) to the left of the middle line, is a small scar 1.3 cm. (½ inch) in diameter. 3.8 cm. (1½ inches) above the left meatus is a crescentic scar, the mouth of the crescent measuring 5 cm. (2 inches). Four inches in front of the inion in the middle line is a distinct blunt boss.

Operation, February 4, 1890. The median line, fissure of Rolando and the parieto-occipital fissure on the left side were marked on the scalp. At a point 1.3 cm. (½ inch) behind the latter, with the centre-pin 3.2 cm. (1¼ inches) to the left of the middle line, a 1½ inch button of bone was removed. The skull was very thick, but the button of bone showed no abnormalities. On examining the exposed dura, there was an indistinct sensation of hardness and tenseness below it. At the lower border of the trephine opening there was a decided adhesion of the dura. There was moderate but perceptible bulging of the tense dura, but no pulsation was visible. The dura was then opened, and as the opening was made the brain substance bulged markedly through it.

Faradism was then applied at various parts of the exposed cortex, without perceptible effect. An incision was next made through the cortex, when the left arm was pronated strongly several times. The right pupil was more dilated than the left, and there was lateral oscillation. An incision was then made in the brain substance at the postero-inferior border of the trephine opening, and the brain explored gently with the finger. There was a sense of an elastic, smooth, hard body about 6.3 cm. (2½ inches) below the surface, probably at the anterior border of the cuneus. A sharp spoon was introduced and an attempt made to determine the size and character of the hard mass, which was distinctly felt. Some pieces of the tumor were removed, but it was decided that on account of its size and depth it could not be removed, especially as the patient's condition was not good. The dura was united and the wound closed. The right angle of the mouth drooped, and there was slight rhythmical tremor of the right levator anguli oris.

He gradually sank, and died fourteen hours after the operation was concluded.

Post-mortem examination, February 5, by Dr. W. J. Taylor. Spleen normal, except an area of infarction; liver small and flabby, with fatty changes; kidneys congested and lobulated, with accessory renal arteries; a small cyst in the pyramid of the left kidney. Vermiform appendix six inches long lying on the surface of the ascending colon, with a complete mesentery. Other organs normal.

Head: The wound looks in good condition. The scalp comes off easily, and no marks of injury can be seen on the skull. The dura rather opaque, slightly adherent, and congested, the smaller vessels showing plainly. Surface of brain apparently normal; no congestion and no œdema on either side. Sinus empty; considerable effusion exists in the vertebral canal.

Brain: A large area of broken-down brain tissue was found at the site of operation—about 5 cm. (2 inches) in diameter. Beneath this is a hardened mass as large as a filbert, the centre exactly 5 cm. (2 inches) from the end of the occipital lobe and 2.5 cm. (1 inch) from the middle line. The part of the tumor removed at the operation is posterior to this and midway between the remaining hardened mass and the point of the occipital lobe. The cavity left by the operation appears to be 1.8 cm. ($\frac{3}{4}$ inch) in diameter, and at the base the hardened mass can be felt extending into the point of the cuneus, where it is in contact with the falx, 1.3 cm. ($\frac{1}{2}$ inch) from the extreme point of the cuneus and the same distance from the middle line, covering an area of at least 1.3 cm. ($\frac{1}{2}$ inch) in diameter. There is marked congestion of the smaller vessels on the surface of the convolutions at the extreme point of the cuneus. Beneath and between the outer convolution of the cuneus is a clot 5 cm. (2 inches) long. The angular gyrus was removed at the operation. The tumor has no limiting membrane, but invades the brain substance, white and gray alike. Base of skull shows nothing abnormal. Dr. Charles W. Burr kindly examined the tumor, and found it an infiltrating glioma.

Remarks.—The diagnosis of the location of the tumor in this case was made by reason of his apraxia and sensory aphasia and the hemianopsia. The diagnosis was exactly confirmed, as will be seen by the operation and the post-mortem, with the exception that the tumor was not superficial, but much deeper than had been supposed. I think we ought to have been led to deem it deeper than we did, by reason of its relation to the cuneus, since a tumor involving both the cuneus and the angular gyrus ought to have been localized as deep rather than superficial; but in view of this condition and the possibility that the tumor might be removable, I think the operation was entirely justifiable. When I reached the depth that I did before I found the tumor, it was very clear to me that its removal was impracticable, and the post-mortem certainly convinces one of this fact.

Brain tumor, however, is necessarily and *per se* a fatal disease. Hence, I do not think that the fatal issue of this operation ought to be put over against the unknown possibility of the removal of the tumor until it was

explored. I shall not soon forget the regret I experienced a few years ago, when at the post-mortem examination a tumor that I had declined to operate on shelled itself out of the brain during the manipulations for the removal of the brain; and the subsequent microscopical examination showed that the walls of the cavity in which it lay were not involved in the disease, although it was a sarcoma. Operation, which I unfortunately declined to do, might possibly have saved his life.

I cannot, therefore, even in the light of the autopsy, regret that this operation was done, as it hastened death but little. In the necessary uncertainty attending the diagnosis of cerebral tumors at the present time, I regard an exploratory operation in suitable cases as not only advisable, but needful. If we find an irremovable tumor, as a rule the patient will not die, and may even be bettered, as has been shown in a number of operations; and if he dies, it is anticipating by a very little what would have been the result without operation. If we do not explore in any reasonable case, we may find ourselves at the autopsy in the unenviable position which I recollect so vividly myself.

Case V. *Trephining for defective development; death from hemorrhage and shock twenty minutes after the completion of the operation.*—M. F., aged eighteen years, kindly referred to me by Dr. John Van Bibber, of Baltimore. She first entered the Jefferson College Hospital February 10, 1890. After a careful study of the case I advised decidedly against operation, and she returned to Baltimore; but in March, 1890, she again came to Philadelphia and entered the Infirmary for Nervous Diseases, on account of the urgent request of her parents that an operation should be done. Her physician and some of my colleagues approved of an exploratory operation on the left side of her head, and I finally consented to operate.

Her history, as taken by Dr. Packard at the Infirmary, is as follows: The family history is negative, excepting that one of her nine brothers and sisters died of convulsions after an illness of thirteen hours, characterized by fever and right hemiplegia three hours before death; and another died at twenty-two, probably from tubercular laryngitis. At her birth, which was not instrumental, there was considerable difficulty and delay in delivering the head and the establishment of respiration. She had jaundice for three months after birth. At eleven months of age, while teething, she had a general convulsion. Prior to this time it had been noticed that she used the left hand more than the right, but until this convulsion it was unknown that the right arm and leg were partially paralyzed, the fact being discovered by the physician who attended her. At two years of age she fell from a baby-carriage, striking on her head, but without apparent ill effects. She began to talk at one year, but advanced slowly in speech. She began to walk at two years of age, dragging the right foot. At three or four years, right facial palsy and wasting of the right side of the face were noticed. During dentition she had five or six general convulsions. At three years of age she had an attack of *petit mal;* at irregular periods after this she had a few other attacks, and from ten years on they have been growing more severe and more frequent, until in the last month she has had five

or six. There is apparently an abdominal aura, as she grasps the abdomen with both hands at the beginning of an attack, and immediately afterward the convulsion becomes general. For the last six months choreiform movements have been noticed in all four extremities.

Her intellect is rapidly becoming more and more defective and her memory failing. There is considerable headache at the vertex. Bowels regular; no vomiting; menstruation regular. Her head is of peculiar shape, looking as if it had been rubbed between two boards moving in opposite directions, and the left side being markedly smaller than the right. From the meatus to the middle line on the left side is 1.5 cm. ($\frac{5}{8}$ inch) smaller than the right, and the left semi-circumference is 1¼ cm. ($\frac{1}{2}$ inch) smaller than the right. The right arm and leg are markedly smaller than the left, with contractures of the flexors of the hands and fingers. Knee-jerk normal on the left side; much exaggerated on the right. Slight ankle clonus on the right side; none on the left. Front tap and paradoxical muscular contraction unattainable on either side. The chest is somewhat deformed, the right side being largest posteriorly and the left largest anteriorly. Sensation not satisfactorily tested, owing to her mental state, but evidently much blunted on the right side, both as to touch and pain.

Professor Cattell kindly examined her on March 8, 1890, and reports: "The arrest of mental development and the asymmetry of the two sides of the body were so extreme that exact measurements were neither necessary nor easy to make. Reaction-time and rate of movement could not be determined, as she was unable to hold a telegraphic key in the right hand.

"Dynamometer pressure: right, 2 kgs. (obtained with difficulty); left, 20 kgs. Sensation areas: Distance at which points can be distinguished, right hand 12 cm., left 2.5 cm. (normal). Pressure causing pain was, right hand 1.6 kgs., left hand 3 kgs., forehead 1.6, head 0.6. Very hyperæsthetic, especially for the right hand and head. The time required to see and name colors was 1.467 seconds; words 1.819 seconds —much longer than normal, especially for words."

Operation, March 4, 1890. Ether. The fissure of Rolando on the left side and the median line were located with the cyrtometer and marked with an aniline pencil. An allowance of 1.8 cm. ($\frac{3}{4}$ inch) to the left of the middle line was made for the probable dislocation to the left of the superior longitudinal sinus, on account of the left atrophy. A 1½-inch button of bone was removed, its inner edge being 1.8 cm. ($\frac{3}{4}$ inch) from the median line. The skull was very thick; the dura bulged slightly. There was no especial spot of hardness or softness to be felt through it. The dura was then incised for two-thirds of the opening, the base of the flap being from the middle line. At one point, when the dura was opened a free hemorrhage took place, amounting probably to four or six ounces, evidently from a large vein. This was controlled with hæmostatic forceps. The brain substance was of an opaque, pearly-gray color, œdematous, but with no evidence of softening or cyst. The convolutions were very hard, feeling like tense worms. Three punctures were made in the œdematous pia, followed by an escape of serum and the subsidence of the pia to the brain tissue. The opening was enlarged downward about a quarter of an inch by the rongeur forceps, when it was noticed that there was a deep furrow extending downward and forward, of evidently atrophied brain. During these manipulations the

hæmostatic forceps seizing the vein sprung open, and another free hemorrhage took place. I almost instantly placed my finger upon it, and got the bleeding vessel again controlled by the hæmostatic forceps; but the amount of blood lost before it was controlled amounted to about five or six ounces more. The patient became suddenly blanched, markedly cold, and collapsed. Hot saline solution was quickly injected into the cellular tissues, hot bottles applied, the legs elevated and the head lowered, and a hypodermic of $\frac{1}{60}$ of a grain of atropia sulph. given.

While my assistants were carrying out these directions a few interrupted catgut sutures were inserted in the dura; the forceps seizing the vessel remaining *in situ*, the scalp was sutured at a few points and a sublimate gauze dressing applied. Transfusion of salt solution was done, but before it could produce any effect the patient died, twenty minutes after the operation was completed.

Dr. C. W. Burr kindly examined the brain, and reports as follows: "Weight, when fresh, twenty-nine ounces Troy. The pia strips off easily. The entire left hemisphere is smaller than the right, measuring 18.4 cm. (7¼ inches) from the extreme point of the frontal lobe over the parietal lobe to the extreme end of the occipital lobe, while the right measures 23.5 cm. (9¼ inches). The convolutions are smaller than normal and the fissures irregular. The fissure of Sylvius is replaced by a deep wide valley extending almost to the occipital lobe, as if all the convolutions bounding it had atrophied and its walls fallen apart and its floor inward. Where the Sylvian fissure should be, the pia is attached closely. The temporal lobe is much shrunken; the fissure of Kolando is very short; the ascending frontal and ascending parietal convolutions are small and their lower parts absent; the corresponding crus cerebri and anterior pyramid is smaller than on the right side; the left hemisphere is harder than the right, and the left side of the skull smaller than the right. In the right hemisphere, apart from irregularities in the courses of the fissures, there seems to be nothing abnormal."

Remarks.—In reviewing this case I regret very much that I did not adhere to my first decision not to operate; but her parents were so anxious that something should be done, in view of her steady mental and physical failure, that I finally consented. It was clearly an error of judgment. Moreover, the operation was not properly planned, especially in one respect: I allowed three-fourths of an inch for the possible displacement of the superior longitudinal sinus, which was one-eighth of an inch more than the difference in the measurements. This I thought sufficient, and rightly; but when I opened the dura, instead of making the base of my flap *from* the middle line, I should have made it *toward* the middle line, so that in lifting it I could have seen any large vessels emptying into the parasinoidal spaces, and so have avoided opening one of these spaces, as at the post-mortem I found that I had done, and this precipitated the hemorrhage which caused her death. That her death was caused by the loss of a moderate amount of blood is a matter of some importance to note, and should make the surgeon especially careful not so much to check as to avoid hemorrhage in any similar cases of

operation on the brain. The hemorrhage was checked very quickly, but evidently hemorrhage from the brain, and especially a brain that is defectively developed, is much more serious *pro tanto* than from other parts of the body.

REST AND FOOD IN THE TREATMENT OF ANÆMIA AND ANOREXIA NERVOSA.

By James F. Goodhart, M.D., F.R.C.P.,
physician to guy's hospital.

The present paper includes two distinct groups of cases; but inasmuch as they are often found together, and are both treated, so far as I am chiefly concerned, in the same manner, I have ventured to bracket them under one heading, although I must discuss each separately. And first of all, Anæmia.

This is a wide subject, and is a symptom of many diseases. I do not propose to deal with it when thus *symptomatic*, but only when it is a substantive affection. And, even thus, I shall not take it in its entirety, for there is anæmia on the near side of middle life which requires one method of treatment, and there is the anæmia which, on the whole, affects the declining half of life, which is styled *pernicious* and which requires a different handling. It is to the anæmia of young adults, and, almost without exception, of women—the disease that has received the name of chlorosis, but which is not always by any means chlorotic—of which I am going to write.

One may feel inclined to ask, "What is there in this subject that we do not already know?" To that I would reply: Probably, nothing; but it is a subject on which men who are entitled to an opinion differ considerably as to the right treatment, and therefore anyone who has convictions on the subject, one way or the other, is at liberty to air them. Not so very long ago no less an authority than Sir Andrew Clark read a paper on this subject in which he contended that anæmia was the result of the constipation which is its common accompaniment, and he advocated purgatives rather than iron as *the* remedy, although he *did* combine a little iron with his aperient pill. That paper traversed one of my most cherished convictions. There are not many occasions in medicine on which, perhaps, one can say, "I *know*," unhampered by any serious qualification. But, having been interested in these cases for many years, and having tested what I say in scores of cases, I venture to say I *know* that iron given properly will cure many of them and that attention to the constipation alone will not. I do not deny that the constipation is an important element in many cases and that it

may make the anæmia worse, but I am certain that it is not the primary factor; that the anæmia is *not* essentially a result of fecal absorption. But there are certainly some who think that iron will not cure all cases. Then I say, that is because one or two considerations are lost sight of, and, as regards iron, because it is not given properly.

Now, treading upon a man's pet corn is not a bad way of causing a little excitement; therefore, let me mention certain common ways of giving iron which, as regards this disease, are not what I call giving it properly. Giving a dose of dialyzed iron three times a day is one of these. Many people are very fond of this preparation of iron; and when it was first introduced dialyzed iron seemed to me to promise well, for it was a mild preparation which might be expected to be taken without upsetting the digestion. I tried it extensively, and came to the conclusion that it was of very little use when compared with other preparations. "It won't do any harm," as a celebrated physician once said of a remedy to a lady of my acquaintance. "Thank you," said she; "I did not suppose that it would, but that was not exactly my purpose in coming to you." To order dialyzed iron is, as far as I know, playing with the remedy and wasting time. The mist. ferri comp. of the British Pharmacopœia is an *old-fashioned*, but, as far as it goes, a good medicine; but here, again, to give an ounce of it three times a day does not satisfy the requirements of most cases, for it only contains the equivalent of 2½ grains of sulphate of iron in carbonate to the ounce, and, although the better for this, patients are not thoroughly renovated, even after a protracted course of the drug. The sulphate of iron, again, is a good remedy, and has the great advantage that it can readily be combined with an aperient in a pill. But, good as it is, it has the drawback that it is difficult to raise the dose to the amount that I contend these patients require, for it has a tendency to act as an emetic. However, it *can* be pushed, if care be taken to do this slowly and steadily, for, like sulphate of zinc, tolerance is easily established and a sufficient dose can then be given. Some, again, are fond of the perchloride of iron, and it, also, is a valuable hæmatonic; but with *it*, even more than with the sulphate, the stomach is not tolerant of large doses in these cases, and therefore I do not give it. Some preparation, therefore, is wanted that *can* be given in *large* doses without disturbing the stomach, and, to my mind, such preparations are chiefly *two:* the saccharated carbonate of iron and the ferrum redactum, or reduced iron. There are numbers of people who will tell you that they cannot take iron, but it is seldom, indeed, that they have any difficulty with either of these preparations. They may either of them be given in half-drachm doses or more three times a day, and they may be given in pill or powder or lozenge. The powder is the least troublesome, and there is seldom any difficulty in thus administering it, if the patient be forewarned that,

although dirty to look at, it is not bad to the taste. There are many people who cannot take pills; those who cannot will nearly always take the powder, and those who cannot take powders will take any amount of pills—indeed, the more the merrier. Perhaps I may be allowed to add that the pills should be made up with glycerin of tragacanth and coated with some of the soluble coatings now in use, lest they should pass through the intestinal canal unappropriated and the remedy thus come unjustly to be looked upon as a defaulter.

But there is yet another point about the iron treatment that is often not sufficiently insisted upon, viz., the *duration* of the course. Hundreds of anæmic people apply for treatment, and we ask, Have they taken iron? Oh, yes, say they, they are always taking it, and it does them no good. But when we come to inquire, they have taken a bottle, or perhaps two, and then left off for awhile. The average specimen of humanity still looks for his cure in his first dose, or, at least, somewhere within the depth of a six-ounce bottle; but it is needful to say that anæmia is not to be cured in so ready a fashion, and half the battle lies in a fair start. In dealing with these cases I always ask them, Are you prepared to carry out the requisite treatment? They, of course, profess themselves ready to do anything; whereupon I make them promise to take their medicine continuously for six weeks. Half-drachm doses, then, of the saccharated carbonate of iron or of reduced iron, given regularly three times a day over a course of six weeks, I consider to be so successful that I never can find heart to waste time (as I believe it is, for the most part) on other means of treatment, whether it be by potassii permanganatis or what not. Nevertheless, iron is a remedy that is not always successful in private practice. I have seen many cases, now, where I have been obliged to acknowledge that the iron treatment has been carried out in all respects properly, and yet the patient has not recovered her color satisfactorily. And in thinking the matter over there seems to me to be a difference in this respect between hospital cases and those in private. I look over the former and cannot remember one that has failed, and the only difference that I could think of was this, that they are invariably put to bed as soon as they come into the hospital and that they are also fed with at any rate a reasonable quantity of nourishment. In the better-class patient it is too often considered necessary only to give so much physic, food and exercise being left to the individual discretion.

Happily, Nature has some pretty stiff automatic checks, and the breathlessness of the anæmic is one of them; were it not so, anæmia of this sort would be a far more fatal disease than it is. But how can these patients expect to get well when they are so bloodless that they have nothing inside them to do a day's work upon, and yet they attempt to do that work. And what is that day's work? Well, "there is

nothing the matter with them," so they do, after a fashion, much as other people do—that is to say, they think or are told that fresh air is good for them, so they drag themselves out to shop and walk. It is quite common to find young ladies thus affected going to early services at church, visiting in parish work, and as to not going to a dance because of their ailment, it would never occur to them for a moment. But after all, their chief exercise and exhaustion comes, I am persuaded, from the quite unnecessary tread-mill exercise they perform for the hundred and one things that they want which are downstairs when they are up and upstairs when they are down. And what do they do this upon? Generally no breakfast—a cup of tea they consider a sumptuous meal; a finger of meat, perhaps, for lunch, and, perhaps, again for dinner at the urgent importunity of their relatives; and if they are particularly well looked after these tiny meals are supplemented by an intervening sup or two of beef-tea, whose one grand virtue is that it has been stewed so long that you can "cut it with a knife."

To summarize, these cases, if at all far gone in the bloodless condition, require:

First, absolute rest in bed for ten days or a fortnight—three weeks is none too much for some cases—and they should not be allowed to take much exercise of any kind for the six weeks that their treatment lasts.

Secondly, they must be fed with good, wholesome food—four meals a day—beginning with milk and egg, which can be taken in the fluid state, and thus stowed away almost regardless of appetite. Good meat and vegetables can soon be added, and each meal should see some addition until a reasonable quantity is taken.

Thirdly comes the iron, as already detailed; and,

Fourthly, any mild aperient that may be necessary.

It is not my purpose to advert to the dangers that attach to the anæmic state. Whether they are few or many, it cannot be that this disease is an unimportant one, although it is so common and so generally remediable that one might well think it so. Unfortunately, it is so very common that the public have no idea of its importance as a disease, and therefore it requires some courage to send a patient to bed for a fortnight and to prescribe a Lent where physic shall replace the accustomed fasting.

But, as I am dealing with the point of curability of these cases, I should like to say that I have several times seen it stated that in distinguishing between pernicious and this form of anæmia that the pernicious form tends to relapse; the chlorotic form, not. This has not been my experience; quite the contrary. These cases frequently relapse after a time, and it is necessary to tell them that it will be so, and that at the first indication of pallor or breathlessness, or, it may be, amenorrhœa, they must return to their remedy for a short course of three weeks

or so. It is a curious disease, and, I believe, has a large nervous element as a factor in its production; but this I feel sure of, that, by its obstinacy and its tendency to relapse, it betokens a rather important constitutional vice, and that it is not a mere intercurrent affection that is treated and done with.

And now to turn to the other disease—anorexia nervosa: It will be remembered that this name was given by the late Sir William Gull to a series of cases which he recorded in the Clinical Society's *Transactions*, vol. vii. p. 22. These cases were very severe, associated with extreme emaciation, and more or less mental depression likewise; but, except for this, there was no apparent disease. A few similar cases have been recorded since, but all of them have been of such extreme degree, and associated with an amount of wasting so excessive—as may be seen by the woodcuts of the cases that have been published with the records—that I think there is no doubt that they have been looked upon as examples of a rare disease rather than as extreme cases of a very common one. At any rate, this is the point that I want to insist upon, viz.: mild anorexia nervosa is one of the very commonest diseases with which we have to deal, although it is, perhaps, not known by the name with which I would christen it.

The sort of case I have in mind is as follows:

"A lady (these cases are always in women and most commonly but by no means confined to the upper classes), aged forty-two, who had never been strong, had been subject to fainting-fits, and had for long had recourse to strong purgatives for obstinate constipation, came to me for attacks of complete collapse; these were said to be so bad by her medical man, who came with her, that he really feared she would one day die.

I went into her history, and found that she was an extremely small eater, having an *objection* to meat, and being unable to take milk and eggs—a rather large order to cut entirely out of a daily dietary. Her attacks of collapse were thus described: She becomes faint and sick, with intense pain about the stomach, thighs, and spine. Her original weight was one hundred and sixteen pounds; she now weighs eighty pounds. Yet her vivacity seemed at times unimpaired, and she expressed herself as quite well and able to do anything.

This was her daily diet:

Breakfast. A cup of tea, without milk or sugar; a finger or two of toast, with very little butter.

Lunch. A very small piece of fish, a little bit of potato, a little salad, with plenty of vinegar; a little claret.

Entremet (afternoon tea, she fitly called it). A cup of black tea, without sugar or milk.

Dinner. Same as lunch.

Was I wrong, upon the facts before me, in characterizing her abdominal and spinal pangs as an expressive, not to say indignant, remonstrance on the part of her abdominal nerve-centres at the cruelty and ignorance with which they were being treated?

She was going out to India in three weeks from the time that I saw her, passage taken, and all things arranged. I mention these little details to enforce a point, viz., that you must be firm with these people; they don't appreciate the gravity of their condition, for use is a second nature to them, and they have got so accustomed to their miserable state of existence that they come and tell you, as this poor creature did, that they feel quite well. Further, they do appreciate very keenly the very disagreeable nature of the remedies proposed. I told her that, go to India or not, she must have six weeks of the *pâté de foie gras* treatment, and if the departure was a fixed and unalterable term it must be continued on board ship. She was put under the care of Dr. Andrews, of Hampstead. He concurred in the diagnosis, had her removed to a small home hospital, and carried out a six-weeks' course of feeding and massage; and I heard afterward that she went out to India later, quite well, having gained more than fourteen pounds in weight, but she relapsed again after a while, as such cases seem liable to do.

I will only burden you with this one case; but remember that I could give you case after case of the same kind, and that is one of the points I wish to make—it is a very, very common ailment.

The next point is, How are these cases brought about? A matter, I think, of the simplest physiology imaginable. These patients are invariably of a neurotic temperament, and in evidence of this I may point to the fact that the disease is almost entirely confined to the female sex, while other well-marked evidence may usually be found in neuralgia, flushings, faintings, etc. The point of this is, as it seems to me, that neurotic people are very commonly people of slow digestion. This is as much so in men as in women, but men very seldom take on this peculiar type of disease; they, for some reason or other, become hypochondriacs and over-critical as regards their intakes and their outputs, and particularly irritating to the medical mind by the very unnecessary detail into which they launch as regards the quantity and color of their fecal evacuations. In this respect, and also in their greater resistance to treatment, men are far less satisfactory patients than women. The neurotic of slow digestion suffers much from flatulence and its consequent distention, and, no doubt, digestion is to them a rather distressful process. The next step is that these people think that they have got the disease "indigestion," and as a very natural result they consult a doctor, and that appears, in a large number of cases, to be the very worst thing that they could do. And why? Because they are thereby confirmed in their belief that they *have* got indigestion. They *thought* they had before—that was bad enough; now they have authority for their belief, and they are on the straight road to perdition.

Having got indigestion they must, of course, diet themselves; perhaps they are already dieted by authority, but, if not, they very readily take to dieting themselves; and first one thing is left off and then another, as, failing to get relief, they still think they are taxing their stomachs

too much. Last of all, they begin the round of physicians great on stomachs and their treatment. This means that for the most part they are still more rigidly fed by rule, and, in addition, they try, one after the other, the various remedies that are supposed "to go for" the stomach—the pepsins, the papains, the soda, the bismuth, the calumba, the mineral acids—according as the individual whom for the day they are confiding in thinks they have, according to his special bent, acid dyspepsia, atonic dyspepsia, gouty dyspepsia, or any other form of the many that have been described.

I have no special antipathy to these various drugs—they are all very useful in their way and if rightly used, even for these very cases I am discussing; but I want to insist, with all the force that is in me, that to treat these people for stomach affections is to do them positive harm. They are never cured by such means, and if they are moneyed people, as they often are, they go from one man to another until the whole round of great names is exhausted, suffer many things of them, and, in the end, think doctors as a genus a pack of fools, for they are worse than they were at the beginning.

We sadly want a little more common sense and real knowledge applied to the subject of diet. Our present practice stands self-condemned when we have to admit that of all the patients who apply for advice, three different printed sheets do for the lot. Such a method is clearly only a matter of routine; the individuality of the patient is out of the account altogether, and there are few things in which the individuality asserts itself more, which I may illustrate by two so-called dyspeptics whom I have seen quite lately: One, after detailing her discomforts, said: "But I am very peculiar, you know; I can eat *nuts* and *radishes* and all that sort of things." The other, after going through a long string of simple things which she could not digest, said: "But there is one thing that I can always eat." Quite thankful to hear it, for it sounded like progress, I inquired what it was, and she said, "*Lobster!*" I wish I had time to enter more fully upon this subject of diet and the many reasonless and, I believe, unphysiological dicta by which we are bound. But I am rather wandering from my subject.

However, these anorexia nervosas leave off first one thing, because they think it disagrees, and then another, and another, and so on until they are existing upon a most attenuated diet, and the wonder is that they are alive at all.

The explanation I would offer of these cases is a more fundamental one, and I take it from a common physiological fact of which we all have more or less cognizance. We all know that if we have to undergo an enforced fast, that at first very hungry, the appetite after a while goes off and we care not whether we have a meal or not. We often find ourselves in similar circumstances, too, when we have been unusually hard-

worked or overdone: "Too tired to eat," we exclaim. In either case the bodily vigor has run too low, the nervous energy requisite for a healthy digestion is not forthcoming; therefore, the appetite is wanting, and food, if forced into the stomach, is only too likely to disagree. It is just so with these cases: they may have a sufficient flow of nervous energy to keep up appearances, just as a raving lunatic may be enabled to put forth an amount of energy which would not have been deemed possible by his associates, and then collapse after it; but they are always tired, and by so doing there is nothing left to charge the abdominal viscera. Hence, the flatulence, the distention, the pain, the indigestion, the constipation, etc.—the stomach is too tired to do its work. But, instead of thus going to the root of the matter, its work is made easier for it, either by diminishing the amount of food introduced or by predigesting what is presented to it, or by both combined. But the stomach is only a bit of human nature, and like its master—or its servant, rather, in this case—if its work is habitually made easy for it and it has little to do, it very readily accommodates itself to its altered circumstances. It would be unkind, indeed, of us to quarrel with it for taking advantage of the proffered ease, when it is so very good-tempered and bears so very uncomplainingly all the many indiscretions to which it is subjected in the opposite direction; and it gets small and lazy—a physiological sloth only—from having nothing to do. And unless you can dispute my fact that these cases are made worse by the advice that they too usually receive, which I do not think to be possible, the explanation of it seems to be patent. Of course they are; for to lessen the work is to accentuate the bad habit into which the organ has been allowed to drift. Clearly, then, the proper treatment of such cases is to restore the nervous energy of these patients, and, having done that, to gradually tax the stomach more and more, until by gradual efforts it is able to remove mountains.

To do all this it is absolutely necessary to send the patient to bed for some little time. It is clearly not conducive to successful treatment to allow her to waste or fritter away the little energy she has by dragging about in the dilapidated state of tissues in which we find her. All the vitality she has is wanted to be concentrated on her blood-making supplies; all waste, therefore, is to be curtailed, all possible energy husbanded, by keeping her in bed. Next comes, I was going to say, food; but I think medicine comes next in natural order, and *that, not* bismuth or remedies directed to any local failure, but strychnine and iron, as helping to restore the vitality of the patient. Then shall come food—and food which, although carefully adapted to the enfeebled organ, shall nevertheless be gradually and methodically increased, both in quantity and variety, until the healthy standard is again reached. Very little attention must be paid to the patient's suggestions in this matter; their

fastidiousness will speedily drive you crazy; and it is very seldom indeed, although they vow they can never digest milk, that, under the altered circumstances in which they now find themselves, it disagrees with them in any way. Milk is the thing to begin upon, and cream may almost immediately be added to it. It is true, they will say the same of cream as they do of milk: it is bilious, etc. You can retort that even babies can digest it, so certainly they can; and, indeed, for weak stomachs of all kinds there are few things better than cream. Pounded meat and vegetables come next, and so on, according to all the details that have been so well advocated by Weir Mitchell.

There yet remain one or two little points in the management of these cases, and the first is to make them understand that in the generally lengthened process of fasting to which they have subjected themselves the cavity of the stomach has probably *contracted*, and that our process of stomach-stretching is not one that can be carried out without some little discomfort—indeed, I have no doubt that it sometimes causes a good deal of pain to the patient, so far as an outsider is able to gauge the degree of pain from which a neuralgic individual is suffering. Further, they must understand that a certain amount of distention of the stomach after food will be their lot through life, more particularly when their general health is rather low or they have been overdone or worried in any way. We are all familiar with that fact. Large numbers of people go about who habitually feel some slight fulness after food for an hour or two, and which subsides after that time, as the stomach settles down to its work and disposes of some of it. But to those of us who are robust, or know that it means little, it gives no trouble; it is only those who dwell upon it that it depresses and makes miserable. The next point is, that from the fixed idea that these people have as regards the injurious effects of certain foods upon their very particular food-bags, it is absolutely necessary to put them under the charge of a properly trained nurse and often to take them away from home. This latter part of the Weir Mitchell treatment may possibly be unnecessary, for they are for the most part intelligent and wanting to get well if only they can be shown how health is to be accomplished; but a nurse is an absolute necessity.

Having got the case thus far on her road of recovery there will come up, probably, the individuality of the patient, and with it a rather nice point to determine, viz., how much food a particular patient requires. We vary so much in this respect; and I believe it is the women who have habitually small appetites who supply the large majority of the sufferers I talk of—people who never have any desire for food, and who, measuring their needs by this low standard, gradually eat less and less, until they collapse. The rule of the life of such a one must be to try

and take, meal by meal, some slight increase on the previous one, until the power to eat is cultivated.

Massage is useful as a restorative to the peripheral circulation and to the muscles, but it is not absolutely necessary.

THE BACK IN RAILWAY SPINE.[1]

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So much has been written upon railway injuries that it is not without some hesitation that I write upon this subject. It has, however, seemed to me that the physical condition of the back has been insufficiently discussed. Certainly far more has been said pro and con upon injuries of the spinal contents, and far more still upon the subject of traumatic neuroses. It has been my fortune to examine a large number of railway and allied injuries, and it has appeared to me that the condition of the back was often poorly understood and often unappreciated, while important points were sometimes entirely overlooked. Further, conditions are occasionally observed which are difficult of explanation, and to these I especially desire to call your attention.

At the outset of our inquiry, we are met with the problem as to what extent pain, a subjective symptom, should be admitted as a factor. We all know that pain of various kinds is met with in railway cases. Now it has seemed to me that we should exclude from this discussion all pains the existence of which cannot be confirmed by any physical evidence, and which rest solely upon the unsupported statements of the patient. Under this head come the vague aches, "weak feelings," and paræsthesias which may be absolutely genuine, but for the demonstration of which there are no known means.

On the other hand, all pain, signs of which are evoked without previous warning or suggestion, should be rigidly admitted. Under this head come all pains signs of which are evoked during palpation, pressure, percussion, and motion, either voluntary or passive.

To begin, it is impossible to separate sharply the symptoms elicited by palpation from those elicited by pressure. Curiously enough too, the very first symptom that presents itself for our consideration, namely, abnormal sensitiveness of the surface, or hyperæsthesia, constitutes a borderland symptom between the subjective and objective groups, the exact significance and value of which it is impossible to fix, and for the present, at least, this symptom must be set aside.

[1] Read before the New York Neurological Society, May 5, 1891.

Very different, however, are the symptoms so frequently elicited by pressure. Here the patient distinctly reacts in a manner that unmistakeably indicates pain. At the outset, however, we must distinguish between two groups of symptoms radically different in their meaning and which are elicited according to whether the pressure is superficial or deep. In the first group we have the well-known tender spots of so-called spinal anæmia or spinal irritation and which are now recognized as being related to purely functional conditions. As is well known, they are elicited by comparatively slight pressure and most frequently over the dorsal and cervical spine; and further, in the vast majority of cases the area of tenderness is small and distinctly limited. Whatever speculation we may indulge in as to their nature, whether we regard them as expressive of some nutritive or functional change in deeper structures or relegate them to the great group of the inexplicables of hysteria, there can be no doubt that these painful areas are genuine. If, without telling the patient just what is being done or what drug is being used, an injection of cocaine be made into a painful spot, the latter, in the fraction of a minute or longer, disappears. At the same time, the painful spots above and below not so treated remain unchanged. Surely upon this and other grounds the inference is justified that we have an actual, a *bona fide*, condition to deal with.

Without pausing to assign this symptom its proper place in the syndrome of railway spine, let us pass at once to the consideration of the symptoms elicited by *deep* pressure. In a large number of cases pain is not complained of unless the pressure made is decided. Care should, of course, be exercised in examining with deep pressure not to cause pain in the superficial structures, especially the skin. This can readily be avoided by pressing with the thumb, and, further, not with the point of the thumb but with its palmar surface. One would, of course, not think of using a pointed instrument or the knuckles in making this test.

The pain elicited on deep pressure differs, I need hardly point out, altogether from that elicited by superficial pressure. In the first place it differs in character. It lacks the acute sensitiveness of the painful spot. The patient reacts later and less suddenly. It utterly fails to resemble hyperæsthesia, which the painful spot in some of its features approaches. Secondly, it is more diffused, and instead of being found directly over the spine it is more apt to be found, and for some little distance, on one or both sides. Lastly, it very frequently bears in its position a distinct relation to the history of the accident. This I can best illustrate by citing one or two cases.

Case I.—A healthy young woman of twenty-four, while standing in a railway station, was struck by the pole of a loaded baggage truck. The truck was being pushed very rapidly and the end of the pole struck

her directly between the spinal column and the right shoulder-blade. Two years and three months later, when first examined by me, I still discovered a very painful area upon deep pressure in this region, though I did not until afterward learn that it corresponded to the site of the injury. Superficial painful spots were not present in this case, nor was the patient in the least degree hysterical.

Another instance is the following:

CASE II.—A finely developed man of twenty-seven, a brakeman, was caught between the bumpers while coupling freight cars. His back and left side were badly squeezed, though no bones were broken. Upward of two years later he presented marked pain upon deep pressure in the lower lumbar and upper sacral region, especially toward the left, and in addition deep tenderness over and above the left ilium. Neither hyperæsthesia nor painful spots were present. Both of these patients, I should say, had suffered from shock and still presented some asthenic symptoms.

Without pausing to multiply instances of this symptom or to discuss its meaning, let us pass to the pain elicited by percussion. It is at once evident that pain elicited by percussion is without significance unless both superficial and deep pain upon pressure have been previously taken into account or excluded. Percussion is, of course, best performed with a rubber hammer such as the Madison-Taylor hammer used in studying the knee-jerk. The patient lying prone, extended and relaxed, a number of very rapid and not very hard blows should be made directly over the spine with the point of the hammer, the idea being to elicit pain not by the force of the blows but by the faint though decided jarring produced.

Aside from the fact that this method will frequently elicit pain in the bony structures when other methods either cannot be well applied or result negatively, it is not improbable that even pain having its origin in the spinal canal itself may be brought to light by this means. Two instances in my experience favor this view. One was a man in my care at the Philadelphia Hospital, who fell from a wall some ten feet high, striking upon the lower portion of the back, and who subsequently developed a concussion myelitis. In him pain, absent in this region to other tests, was elicited in the lower dorsal and upper lumbar region by the hammer used in the manner described. The other case was the patient exhibited at the last meeting of the American Neurological Association, held in Philadelphia, who had been cured of paraplegia by the resection of a number of spines and laminæ. In this man pain on percussion was one of the most definite and valuable symptoms present, and in the course of the operation marked inflammation of the dura with adhesions to the subjacent pia were revealed, while the fragments of bone removed appeared healthy. These cases are very suggestive, and it certainly is not improbable that this method of percussion—that

is, the jarring produced by slight though very rapid blows—may be of decided value in cases otherwise obscure.

Having briefly touched upon the examination of patients by palpation, pressure and percussion, let us now turn our attention to the important tests by motion.

In regard to pain elicited by voluntary motion the objection may properly be urged that here an opportunity is presented to the malingerer. However, there are, as will be pointed out, so many other means of ascertaining the truth at our disposal that difficulty in arriving at definite conclusions will rarely be experienced. In the first place if there be pain on movement there is an instinctive tendency to prevent all movement. The back is held very stiffly and very frequently indeed the patient adopts peculiar and striking attitudes. (This is well illustrated in Figures 1, 2, 4 and 5.) Further, if the patient complain of pain on voluntary movement, passive movement of the trunk in directions and at times not expected by the patient will generally act as a safe corrective to statements made by him. In addition certain physical conditions of the muscles are apt to be present; namely, the muscles in the painful area and its immediate neighborhood are apt to be in a condition of spasm either continual or coming on at such times when movement either voluntary or passive is attempted. This feature when present is most valuable, as it cannot be simulated and as it does away absolutely with the suspicion of malingering. Finally, the muscles which are in a state of spasm are painful when touched and are also in a condition of heightened reflex irritability.

Much depends upon the manner in which the various tests for motion be applied, and it may not be out of place to consider them in detail. They are flexion forward, lateral flexion, torsion and transmitted shock.

Having first practised palpation and pressure and gleaned such information as can be obtained from these sources, we should closely observe the back as the patient stands before us, supposing of course that he be not paraplegic. He is now directed to bend forward. The points to which our attention should be directed are, the manner in which the act is performed, the amount of motion in the back itself, the stage in the act at which the patient complains of pain, if any, and the area to which the pain is referred, and finally the occurrence of muscular spasm. If rigidity be a marked feature the patient will often merely throw the back forward as one piece, motion taking place only at the hip-joints. (This is well illustrated in Figure 5.) If urged to make a more decided effort, the patient will frequently bend the knees, stoop, adopt, in fact, any expedient that will save the back. In cases less marked the patient will upon urging begin bending the back, but very soon will check the movement, protesting that it gives him pain. Very frequently also decided spasm makes its appearance in the muscles at

this time. The spasm, when present, is usually most marked, unless otherwise determined by some detail of the accident, in the lower dorsal and lumbar regions. In cases still less marked than the above forward flexion may be almost completed before pain is complained of or, what is very important, motion may only be restricted in one part of the back. Thus a patient may hold the neck and shoulders very rigidly but flex the lumbar spine quite well, or there may be little or no movement in the lumbar region while the upper part of the spine is flexed considerably.

Supposing now that this test has not yielded decided results or that the patient in his unwillingness to bend the back has opened himself to suspicion, forcible flexion may justifiably be resorted to. Of course the adoption of this procedure depends absolutely on the good sense and judgment of the investigator. We should remember that the pain excited by forcible flexion is often extreme.

We next practise lateral flexion. Here the same points are of course to be observed as in forward flexion. It occasionally happens that in cases where forward flexion has failed to elicit symptoms, the latter are brought to light when the trunk is bent to one or the other side. This generally corresponds to some peculiarity of the accident. For instance, in the case of the brakeman already mentioned who was squeezed between the bumpers of cars, my notes read as follow: "No pain upon forward flexion. Marked pain upon flexion to the right. Pain referred to left side and extending from ilium to lower ribs." It should be remembered that it was the left side especially which had been injured.

Should forward and lateral flexion have failed to elicit symptoms or should the latter have been doubtful, torsion may be practised. An assistant kneeling before the patient should firmly grasp the hips, while the operator, seizing the shoulders, should gently but firmly rotate the trunk. If there be deep-seated soreness the patient will soon give signs of suffering. This method of searching for pain is a powerful one and is rarely of itself required, as most pains are readily elicited by the flexion tests. It may be, however, that in a given case the muscles of the back have suffered less than the fibrous tissues and smaller joints of the spine itself, and in such instances this test may be a very valuable one. While flexion both forward and lateral reacts upon the spine it reacts more powerfully upon the muscles. Torsion, on the other hand, reacts more powerfully upon the spine itself.

We now come to the test by transmitted shock. This may be practised in various ways. The patient standing as erect as possible, the operator places both hands with fingers interlocked on the head and then by a sudden downward pull sends an impulse through the spine. The amount of force exerted must be gauged by the reaction of the patient. The spine may be so very sore that the reaction to even a

slight impulse is excessive, and needless suffering may be caused. A gentle pull should first be made, and if no response is elicited from the patient a more forcible one may be given.

If it be desired to eliminate the cervical portion of the spine from the problem, the patient may be seated and the impulse be transmitted through the shoulders. On the whole, however, this method will be found less satisfactory than the preceding.

A third method is to direct the patient while standing to raise himself upon the toes and then to let himself fall back heavily upon the heels. This method is also less valuable than the first. A man with a very sore back can absolutely not be made to execute this test properly. At most it should be used as a confirmation of pain elicited by other means.

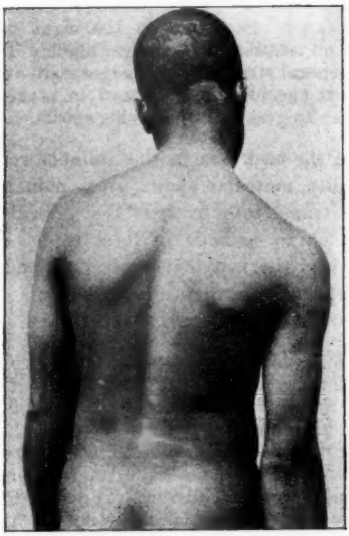
We have thus far considered, though briefly, the various tests for eliciting pain. Not only is it possible with due care to settle the question of the genuineness of the symptoms by any one of the methods detailed, but it is also evident that there must be a general correspondence in the results of all the methods. We should expect, for instance, that the area of pain upon deep pressure should correspond, other things equal, to the area of pain on motion, or that the region of pain elicited by percussion should correspond to the region of pain elicited by transmitted shock. Admitting then for the present the reality of the symptoms, and without pausing to discuss their probable lesions, let us turn our attention to a few typical instances of the railway back.

CASE III.—J. C. J., colored, aged twenty-nine years, married, and a coachman by occupation, was in good health up to May 3, 1889. On that date, shortly after midnight, while driving an omnibus containing twelve passengers across the tracks of a railroad the vehicle was struck by a fast freight train. The coach was instantly demolished, three passengers killed, and the others more or less injured. Our patient says that he lost consciousness at the moment of the collision. Eight or nine hundred yards from the scene of the accident he was taken off the engine, on the front part of which he had been jammed.

He remained unconscious for five days. Consciousness then gradually returned, but he was for a long time dazed and confused. He felt great pain "all over," but especially in the head. Pain was also marked in the back and in the right shoulder. He also expectorated considerable blood. Little by little he began to improve, but it was not until six weeks after the accident that he was able to leave his bed. The pain in the head and back, however, steadily persisted. He was weak and nervous and could not sleep well. He seemed to improve a little, however, until December, 1889, when he seemed to reach a standstill. Three months later he was examined by the writer and presented the following conditions: When stripped his peculiar attitude was at once noted. (See Fig. 1.) His head and neck were thrown slightly forward and to the left, while the right shoulder was held much lower than the

left. At the same time a huge scar extending transversely along the base of the skull from the right mastoid process to the median line was found. Here, as his physician stated, he had received at the time of the accident a deep lacerated wound. On the right parietal eminence another scar an inch and a half long was also found. It was also noted that in talking he did not turn his head but held it fixedly in the position already described. On touching the back it was found that the muscles, especially to the right of the spinal gutter, in the neck, and to

Fig. 1.



the left in the dorsal region, were swollen and hard. The spine was exquisitely sensitive to superficial pressure, while deep-seated soreness was made out over the muscles on both sides. Great pain was elicited upon attempts at flexion, torsion, and upon transmitted shock. The pain was especially referred to the cervical and the dorsal regions, being worse in the former. All attempts at movement resulted in greatly increasing the muscular spasm. Spasm of the muscles could also be excited by very slight handling. The right shoulder was somewhat painful on motion. There was also marked diminution of the grip on both sides, especially the right; the right hand registering 35, the left 62. In addition there was distinct awkwardness of movement of the right arm and an excessive display of effort. Further sensation was distinctly diminished on the right side as compared with the left and the patient frequently made errors in locating the impression, generally referring the point touched, if, say, on the middle phalanx of the finger, to the proximal phalanx; or if on the proximal phalanx, to the metacarpus, and so on. Knee-jerks at first exaggerated, but soon exhausted.

No eye symptoms. Eye-grounds normal; no contraction of the visual field.

Patient complained greatly of headache and backache. Slept badly. Frequently had attacks of "terrors" at night during which he felt his heart beating very fast. Also complained much of dizziness, ringing in the ears, and said that he could not get his mind settled. Mentally he was much depressed.

Fig. 1 is based on a photograph taken in March, 1891, and it is seen that much of the original condition still persists. The attitude is still characteristic and muscular spasm and rigidity are still present, though in a lessened degree. The awkwardness of movement in the right arm has largely disappeared. Sensation on the right side is fully up to normal and errors of location are no longer made. There has also been some increase of general strength. Damages were awarded the patient about a year after the accident, but seemed to make no change in his condition other than to greatly improve his spirits.

The condition of the back was in this instance very typical. There was excessive rigidity, muscular spasm, great pain upon pressure and motion, and at the same time many of the general symptoms of persistent nervous shock so common in these cases. Especial attention should be directed to the fact that superficial tenderness was present in this case distinct from pain upon deep pressure.

The following constitutes another instance:

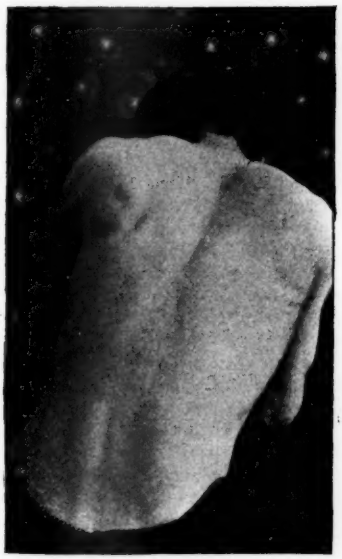
CASE IV.—G. T., aged forty-six, single, and an upholsterer by trade; was in good health up to October 22, 1890. On that day he was sitting on the rail of the South Street bridge (Philadelphia). His hat blew off, and letting go his hold upon the rail to catch his hat, he lost his balance and fell a distance of thirty feet upon a mound of earth. He struck upon the back and head, became unconscious and remained so until he found himself in the University Hospital, to which he was removed on the same day. He was at first very much confused and suffered intensely from pains in the back and head, and his entire body seemed to tremble. On October 27th he was transferred to my ward at the Philadelphia Hospital. When first seen by me he walked into the the office of the nervous pavilions, walking without assistance. He seemed, however, weak and his steps were evidently shorter and slower than normal. He stripped to the waist without help. He complained of pain in the lower dorsal and lumbar regions, and here deep pressure revealed great soreness. Marked pain was also elicited in this region by flexion, torsion, and transmitted shock. Marked spasm of the muscles in this region was also noted on movement. In addition there was marked tremor of both arms and shoulders. He also complained of headache and seemed much depressed.

He was at once placed in bed on the rest cure. Milk in as large quantities as he could take was given, and for a time massage was attempted, but this had soon, owing to the painful condition of the back, to be abandoned. Instead of improving, however, his symptoms steadily increased in severity. His back became more and more painful. The muscles soon attained a condition of almost constant spasm, and as a consequence rigidity was very marked. The back also became

sensitive to superficial pressure. Excessive sweating also set in. Tremor became more pronounced than ever. Four weeks after admission his symptoms had attained their height. The man was thoroughly and abjectly miserable. He was excessively depressed, cried easily, complained of headache, said that he could not sleep, dreamed sometimes that he was falling again from the bridge, had ringing of bells and hissing noises in his ears, trembled worse than ever, had difficulty in passing his water, frequently had sharp pains shooting through his back and head and even in his abdomen. In addition there was now decided loss of sensation in both feet and he was utterly unable to stand. His weakness was extreme. Sweating was excessive. Bowels constipated. Knee-jerks were much exaggerated.

He remained in this condition with but little change until the latter part of February. He was now able, though at the expense of great suffering, to sit up long enough to permit his being photographed. (See Fig. 2.) Afterward he was immediately returned to bed. The photo-

Fig. 2.



graph, though taken under the disadvantages of the diffused daylight of a hospital ward, shows, beside the peculiar attitude adopted by the patient, the spasm in the muscles. This spasm I should say had radiated to all the muscles of the back and even of the shoulder. An important symptom closely related to this spasm, and which should have been mentioned before, is the fact that the man spoke with great difficulty. His speech was short and jerky and seemed to give him pain in the back. It evidently caused him considerable effort and tired him

very much. Whether there was here a psychic element at play, or whether the effort caused the spasm to radiate to the chest muscles and perhaps also the diaphragm, it is impossible to say. The latter view, however, seems to me to be the more probable.

The slight improvement in the patient's condition noted in February has continued up to the present time. The patient, as a whole, is stronger, sweating is less marked; he is able to get out of bed and take a few steps without assistance. The rigidity of the back, though still present, is evidently diminished. Muscular spasm is, however, marked in the lumbar region and the muscles still show excessive reflex excitability. Superficial spinal tenderness has largely disappeared, but pain on deep pressure is still present. Knee-jerks still exaggerated. Sensation in feet and legs up to normal. Difficulty of emptying bladder; though lessened, still persists. Mentally the patient has much improved and when last seen was quite bright and cheerful.

The absence of litigation makes this case an exceedingly valuable one. In a number of its features, too, it is unusually interesting and instructive. The fact that this patient steadily grew worse for almost five weeks, and this, too, in the face of absolute rest and forced feeding, is very remarkable. In spite of everything, his spasm, pain, rigidity and asthenia steadily increased. It is somewhat difficult to frame an explanation, but the fact must be admitted. He is still in bed. Eye symptoms, it should have been stated, were not present. There was no contraction of the visual field.

CASE V.—A case somewhat similar is that of B. W., aged forty-two years, married, and a carpenter and builder by trade, who presented himself at the University Hospital, December 5, 1890. Last June, while erecting a barn, he was struck by a large rafter in the middle of the back, knocking him down and pinning him to the earth. He was unconscious for a few minutes and later on was sick at his stomach. Vomiting occurred repeatedly during the next four days, the vomit occasionally containing blood. During this time he was not confined to the house, but continued outside directing his men at their work. He said, however, that he felt giddy and was afraid to climb to a height. His back, too, felt quite sore. About a week after the accident he began to be troubled with headache, while the giddiness became more and more marked. The soreness now spread all along his spine. His physician, who accompanied him to the hospital, said that pressure upon the spine now made him sick at the stomach and also caused his face to flush. He was obliged to remain in-doors. He was unable to collect his thoughts, could not concentrate his attention upon anything. Slept badly, at night was restless and "delirious." He had also become very weak.

Examination disclosed marked rigidity of the spinal column, excessive spasm and tremor of apparently all the muscles of the back, great pain on pressure, especially at the site of the injury; pain on movement in any direction; knee-jerks exaggerated on both sides; ankle clonus present in both feet; paradoxical contraction of tibialis anticus; excessive sweating and occasional flushing of the face. Mentally the man did not seem much depressed. He was bothered about

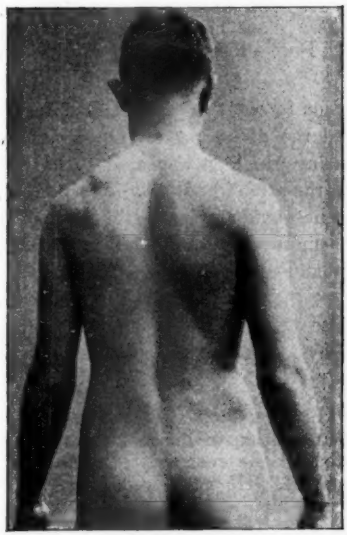
not being able to conduct his business, but otherwise seemed to take his condition quite philosophically.

This case is also interesting, because of the delay in the maximum onset of symptoms and also because of the bloody vomit. In accordance with our suggestion his physician placed him on the rest cure, and at last accounts he was considerably improved though still in bed. There was, of course, no element of litigation.

All three of these cases are interesting because of the entire absence of symptoms usually relegated to the domain of hysteria. In the following case, however, distinct hysterical symptoms are added.

CASE VI.—(See Fig. 3.) H. M. G., aged twenty-three years, an employé in a rolling-mill; was in good health up to May 3, 1889. He was injured on that date in the same accident as J. C. J., the colored man

Fig. 3.



whose case has already been detailed. (See Case III.) He was sitting beside the colored man on the driver's box when the omnibus was struck by the engine. The last thing he remembers is the fact that they were crossing the railroad track. He then lost consciousness and some time later found himself lying on the platform of the adjacent station. Was confused but remembers that he asked to be taken home. That night he was very nervous and excited and continually imagined that "the train was coming on him." Had great pain in the head and back; could not move at all on account of it. For several days afterward he was "absent and bewildered." He could not pass his urine and had to

be catheterized, while his bowels were obstinately constipated. He was confined to the house, in bed and out, for a period of eight weeks.

He was first examined on May 7, 1890, a year after the accident. He complained of constant pain in the head and back. The spine was excessively rigid and very sensitive to superficial pressure. General surface of the back hyperæsthetic. Great soreness to deep pressure in small of back. Pain in this region on flexion, torsion, and transmitted shock. Slight lateral curvature to the right. Decided spasm of the lumbar muscles on the left side. Reflex excitability of the muscles of the back generally, very great. Excessive knee-jerk and ankle clonus on both sides. Cremaster and abdominal reflexes likewise excessive. Chin reflex also elicited. Patient appears to be very weak. Grip much below normal and very tremulous. Both legs weak. Patient limps badly with the left foot. The instep is evidently very painful; the foot had been wrenched or badly bruised. Sensation appears to be everywhere good, though patient occasionally makes errors of location.

He cannot work, cannot think clearly, cannot fasten his attention. Worries and feels badly. Is very low-spirited. Sleeps poorly, and dreams occasionally frightful dreams in which the horror of the accident recurs. At those times his heart beats very fast. Has at times ringing in the ears. Pupils large and very mobile. Visual field much contracted for both eyes.

I have had occasion to see this patient at intervals ever since, and repeatedly confirmed the above notes. On a number of occasions he had convulsions, during which he appeared to be oblivious of his surroundings. During the attack he would imagine that the accident was again occurring and he would cry out, "It is coming! it is coming!" evidently meaning the engine, and would be in a perfect paroxysm of fear. From descriptions that I obtained I judged the attacks to be distinctly hysterical.

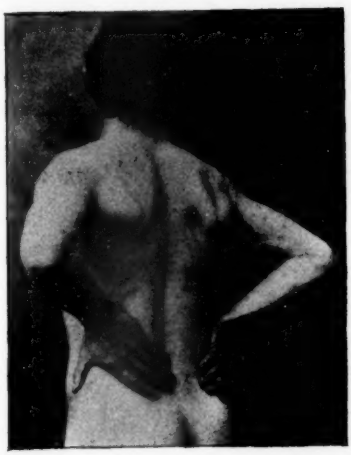
The following case (Case VII., Figs. 4 and 5) presented mental symptoms probably hysterical in nature, associated with a *bona fide* railway back.

CASE VII.—G. H., aged forty-two, married, a carpenter by trade, was in good health at the time of his accident, which occurred May 24, 1889. He was seated in the rear end of a rear car of a train which was standing at a station. He was leaning forward and turning to the left when another car, which was being added to the train, struck the car in which he was seated with great force. His head and shoulders were violently jerked backward. He instantly felt great pain in his back and cried out, "My God, my back!" He supported his back with his hands, remained on the train a short while until his destination was reached and then tried to work. However he was soon obliged to give up the attempt, for whenever he tried to use his saw or his plane the pain in his back became unbearable. On the next day he made another ineffectual attempt to work. He persevered for two hours and a half and was then forced to lie down for the balance of the day. The next day was spent altogether in lying down, and from this time on he made ineffectual attempts at working, working fractions of some days and on others not at all until July, when he was obliged to desist altogether.

From September to December of the same year he again managed to work fractions of days, but always at the expense of great pain. Since that time he has been unable to work a stroke. He had grown decidedly worse. Was very weak and nervous, while his back was more painful than ever. He became very despondent and his appetite became very poor. He continued in this condition with but little or no change until February, 1891, when he had an attack of great mental excitement resembling mania, during which he manifested persecutory delusions and attempted suicide. The attack lasted from ten to twelve days, when depression again supervened. He became perfectly rational, but failed to remember any of the occurrences of the interim. Since this time he has had a number of convulsions which, from their description, were evidently hysterical in character.

Examined in March last he presented the following symptoms: His face is drawn and flat. Pupils excessively dilated. Eyebrows elevated and brow wrinkled, giving peculiar expression to face. Patient walks in

FIG. 4.



a peculiar manner, carrying his trunk very stiffly and supporting the small of the back with both hands. (See Fig. 4.) He rocks from side to side, throwing the right leg out and forward and slightly dragging the left.

The spine is exquisitely sensitive to superficial pressure, and deep pressure causes apparently intense pain. The muscles, especially in the lumbar region, appear to be very sore and in a condition of constant spasm. On handling them the spasm increases in severity and is evidently very painful. It is most marked on the right side. It is impossible to get the patient to flex the spine. He simply leans forward in the manner illustrated in Figure 5. Transmitted shock also elicits pain in the lumbar region. Knee-jerks plus on both sides, but readily exhausted. No anæsthesia. Bowels constipated; urine voided with much effort.

A remarkable and striking peculiarity of this patient is the difficulty he has in talking. His speech reminds one somewhat of the man who fell from the bridge, Case IV. It likewise is short and jerky and is evidently related, as in Case IV., to the spasm of the back muscles. If the man is in a condition of relative repose, the words can readily be understood and are merely uttered in a sharp, explosive manner. If, however, the spasm of the back muscles be increased by movement or by handling, the speech becomes so jerky as to be practically unintelligible, and indeed the patient is often compelled to desist from the

Fig 5.

effort. It is exceedingly probable that this condition is owing to the fact that the spasm may radiate from one group of muscles to another and thus involve the chest and abdominal muscles. The involvement of the abdominal muscles is, by the way, quite evident at times. Further, when we reflect that the crura of the diaphragm arise from the very region of the spinal column which is proven by other tests to be the seat of the sprain, it becomes evident how readily the diaphragm might itself be affected with spasm, and this I believe, indeed, in the present instance, to be the case.

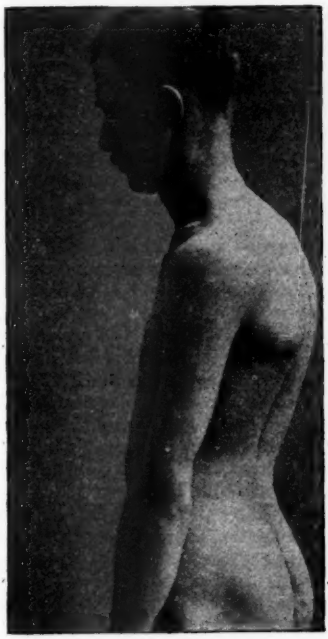
This patient, together with Case VI., resembles Cases III., IV. and V. very closely as regards the condition of the back and the associated symptoms of general asthenia. The fact, however, of the occurrence of the hysterical convulsions introduces another element to which full weight should be given. Regarding the physical condition of the back, however, let me repeat, there can be no doubt in either case.

I do not desire to tire by multiplying records and descriptions, but before entering into a discussion of the general questions involved, I will briefly present another case because of a condition not noted in the

others, and because of the valuable lesson it teaches as regards the possible duration of the railway back.

Case VIII.—F. W. S., male, aged twenty-seven years, married, a barber by trade; was injured February 23, 1887, during a collision between two street cars, the latter pursuing routes at right angles to one another. The collision was so violent that the car in which our patient was sitting was derailed and thrown over to the curbstone of the sidewalk, while his position was such that the full force of the blow was

Fig. 6.



received by his back. He was thrown violently to the opposite side of the car while another passenger fell with and upon him. He was not rendered unconscious, but got up and walked to a neighboring store. He stood waiting for about three minutes and then boarded another car on which he rode about a mile. On leaving this car he became faint and weak and had to cling to surrounding objects for support. He was finally assisted to his home by a stranger and at once went to bed. Here he remained for six weeks. Backache, headache, disturbed sleep, and frequent micturition were symptoms from which he suffered.

He was first examined November 11th of the same year. Flexion, torsion, and transmitted shock, as well as pressure, elicited pain in the lumbar region. Marked muscular spasm was also noted on motion. In

addition there was marked general weakness. The grip was weak and tremulous and there was also decided weakness of both legs, especially the right. Weakness, however, was not by any means confined to the extremities, but was also marked in the truncal muscles. (See Fig. 6.) The weakness of the back muscles was indeed so decided as to give rise to marked lordosis, and to this condition I desire particularly to call attention. Rigidity was not a marked feature at the time of the examination, and spasm was only excited by motion. When left to themselves the muscles everywhere became relaxed, resulting in the condition mentioned.

The associated symptoms in the case were similar to those already familiar, and need hardly be mentioned. There were present exaggerated knee-jerks and ankle clonus, while a chin reflex was also elicited which curiously enough involved in its response a contraction of the platysma myoides. No marked sensory symptoms. Mental condition that of depression. Sleep bad and frequently interrupted by the desire of voiding the urine. Frequent micturition a constant and distressing symptom. Urine free from sugar, but perhaps a little increased in amount. Sexual desire and power in abeyance.

Damages were awarded this man in November of 1887. In February, 1889, almost two years after the accident, I examined him again. There was no material change in his condition. There had been some gain in weight and there was much improvement in his mental condition, but pain in the back and muscular spasm were elicited as before. The reflexes were still exaggerated and ankle clonus was still present. The chin reflex, however, was less readily elicited than before. There had been some gain in general strength, but he was still unable to work more than two hours a day. Frequent micturition still present and necessitating his rising four or five times at night.

On May 29, 1890, he was again examined, as also in March, 1891, when the photograph was made (see Fig. 6), now fully four years after the accident. Little change has taken place in his condition. The pain in the back on flexion is somewhat lessened, though forced flexion provokes muscular spasm as of old. Pain can still be elicited by torsion and transmitted shock. The reflexes are still exaggerated, though less so than formerly. Micturition, however, is still as frequent as ever. General asthenia is still very marked, and, as he tells me, he still spends the greater portion of his time in lying down. Lordosis is perhaps a little less marked than formerly, though, as seen in the figure, still very evident.

The various symptoms presented by the six cases I have instanced can be conveniently grouped as follows: First, those due to the physical condition of the back; second, the symptoms of functional derangement and asthenia; third, psychic and hysterical symptoms. To the first group belong—first, pain on deep pressure; second, pain on motion and transmitted shock; third, muscular spasm and rigidity; fourth, muscular weakness.

Now the pain elicited by pressure, motion, or shock is evidently the result of a deep-seated injury either to the ligaments of the spinal column or to the muscles, probably to both. Practically it is impossible

to differentiate between the two, nor is it important. We should remember, in thinking of the muscles, that they are normally in a state of tension, especially when the trunk is erect. Indeed, the physical condition presented is that of a bow with many strings. It is not difficult to understand how, under these circumstances, jars and blows should cause serious though perhaps minute strains of the muscles, especially in their tendinous insertions, and these, as we know, are excessively numerous. Further, it is not impossible that at times even the intervertebral cartilages and the joints formed by the articular processes may be the seat of sprain. I should certainly regard this probable in cases that reacted inordinately to transmitted shock and torsion.

To muscular spasm and rigidity are to be assigned the same value which is assigned to the muscular spasm observed in a sprained, a dislocated, or a broken limb. The muscular weakness, resulting occasionally in lordosis, is to be ascribed to the general weakness resulting from the shock and also to the direct effect of the trauma upon the muscles themselves.

To the group of symptoms of functional derangements and asthenia belong of course the various symptoms of general weakness, both mental and physical, tremor, sweating, inability to properly expel or to retain the urine, etc., but it is not our business to deal with them here.

To the group of psychic and hysterical symptoms we must of course relegate the hypochondria, the night terrors and the convulsions. These likewise it is not our business to discuss.

One important problem, however, still presents itself. Why is it that some of these cases do not attain their maximum severity for days and weeks after the accident? This was especially illustrated in Cases IV. and V. Both of these men suffered comparatively little at first, but after a time the symptoms were of the most pronounced character. I confess that this problem is somewhat difficult to answer. It has, however, seemed to me exceedingly probable that there was here a direct extension of inflammation from the original site of the trauma along the sheaths and tendons of the muscles. It is difficult to escape from this inference, inasmuch as there was a marked spread in the area of pain on deep pressure. Hand-in-hand with this there is beyond all doubt a radiation in the muscular spasm, a radiation too which may reach not only muscles immediately adjacent, but those even relatively remote, such as the muscles of the abdomen or the muscles of the shoulder.

Before closing I desire to touch on a point of great practical importance. We are almost invariably asked as to the probable duration of the symptoms and as to the prospect of entire recovery. Of course, an absolutely definite answer can never be given. It is a question of probability and of degree, and therefore one in which legitimate differ-

ences of opinion may obtain. However, taking the cases I have presented it is evident that chronicity must be admitted as established beyond cavil. Case IV., the man who fell from the bridge, has now been six months in bed and though somewhat improved is far from well. Case V. is now of ten months' duration and is still under treatment. Neither case involves litigation. Cases III. and VI. have each received damages, and yet two years after the accident, though slightly improved, each preserves the prominent features previously present. Case VII. is, I believe, still unsettled. However, it is improbable that anyone qualified to judge would fail to recognize the physical condition of the back. This, at the end of two years, is still very marked. Finally, Case VIII. still presents at the end of four years the more important points fully intact. Some improvement must be admitted with regard to all of them, and yet the photographs taken, all very recently, speak for themselves.

In regard to the disappearance of so-called "litigation symptoms," made so much of by Page and others, my observation has been that when a claim for damages has been settled, the mental condition improves very much. A man who, perhaps, is poor is suddenly raised to a condition of relative wealth. No wonder that hypochondria often disappears and is replaced by buoyancy and exaltation. It were strange indeed if it were otherwise. After a while, however, I have seen the old mental condition partly reëstablish itself while the physical condition had undergone no change save that which could be accounted for by the slow repair of time.

Lastly, the cases which I have presented were selected because of the marked and pronounced condition of the back. I do not, however, wish to create the impression that every case should present the back symptoms to an equal degree in order to be considered genuine. As a matter of fact, in a large number of instances of *bona fide* railway back the symptoms are far less evident than in the cases here detailed. To cite illustrations would add unnecessarily to the length of this paper. I will simply repeat that careful application of the various tests for eliciting pain and spasm cannot fail to evoke a reply if trauma be really present.

INOCULATIONS FOR YELLOW FEVER BY MEANS OF CONTAMINATED MOSQUITOES.

By Charles Finlay, M.D.,
of Havana.

At the time when my former article was written[1] I observed that the figures there given were not considered by me, "from a statistical point

[1] "Yellow Fever: Its Transmission by Means of the Culex Mosquito." American Journal of the Medical Sciences, October, 1886, p. 395.

of view, to afford any definite clew either in favor or against the prophylactic value of my inoculations." In fact, neither the number of my experiments nor the length of time during which the parties inoculated had been under observation could at that time justify any scientific deductions. Now, however, the case is different; I have on record a series of sixty-seven persons, including all those whom, in collaboration with Dr. Delgado, I have inoculated since 1881, by means of contaminated mosquitoes, in the manner explained in my previous article. All were Europeans, with few exceptions natives of Spain, young adults recently arrived in Cuba and presenting the usual conditions which imply liability to contract yellow fever. Among the sixty-seven a considerable number, fifty-two, are considered as acclimated, either from the fact that they have resided in the infected quarters of the city of Havana (the old town) during periods varying between three and seven years, or in consideration of their having experienced fevers which are attributed to the yellow fever infection, though of a mild type in the vast majority of the cases. Two parallel groups, one of thirty-three *inoculated* persons and the other of thirty-two *not inoculated*, both offering to all intents and purposes such similarity (as to susceptibility and exposure) as can seldom be obtained, afford a reliable foundation for a fair and unbiassed comparison. I consider, therefore, that the time is now come when some practical inferences may be drawn, and, as far as they go, I am happy to say that they agree with my former expectations.

The statistical method of demonstration is, at best, a tedious and a slow process, but it can boast of great triumphs, such as are recorded in the instances of Jenner and Pasteur, who have had to rely exclusively on its results in order to bring over to their views the balance of scientific opinion and public favor. They represent, moreover, two distinct applications of that method. Jenner vaccinated indiscriminately a vast number of subjects in order to verify subsequently the immunity enjoyed by the majority when exposed to the variolous infection. Pasteur, on the other hand, adopted the system of carefully registering every person inoculated by his method after being bitten by a rabid animal, and afterward comparing the statistical results observed in them with the average proportion of hydrophobic cases developed in the non-inoculated after similar bites. I have chosen Pasteur's plan, believing it to be the more reliable and more applicable to our case. It cannot be denied, however, that, limited as we have been in our field of experiment, our numbers cannot compare with those of the glorious French investigator, nor that we labor under a disadvantage in having to deal with a disease which so far has not been proved to occur, under ordinary circumstances, in lower animals. Thus obliged to confine our investigations to the human species, it could hardly be expected of us

that we should carry our scientific zeal to the point of seeking, through a bolder application of our inoculations, to determine a violent attack of the disease—thereby carrying conviction, no doubt, to the sceptical mind, but at the risk of having betrayed the confidence placed in us.

A somewhat specious objection was recently raised against our mosquito-inoculations, on the plea that the proboscis of the insect not being susceptible of sterilization many accidental germs might be inoculated together with or instead of those of yellow fever, supposing the latter to exist in the proboscis of the contaminated mosquito. To this hypothetical imputation I can oppose many facts. In none of our numerous inoculations has such an occurrence been observed, nor has it ever been proved that the acclimated inhabitants who are constantly being stung by those insects acquire thereby any specific infection. I have on several occasions introduced into sterilized tubes provided with agar jelly mosquitoes that had stung acclimated persons. In most of these experiments, after several days' confinement, the insect died for want of food, and yet not a single colony appeared upon the jelly; when any growth was developed it mostly consisted of fungi, the spores of which had probably been introduced accidentally while transferring the insect from one tube into another. From this curious result I infer that the insect has some means of rendering its outer surface aseptic, and probably does so through a very peculiar operation which I have often seen it perform. This consists in collecting with its hind or middle legs a secretion expelled from the posterior part of its body, and besmearing very persistently with it every part of its body—legs, wings, head, and proboscis. I also believe that we are justified in admitting that the liquid which the insect employs to lubricate its complicated sting, and which being poured into the wound occasions the painful sensation felt by its victim, must vary in its chemical composition in different species of gnats, thereby accounting for the difference in the sensations occasioned by their sting. It is quite possible, therefore, that the presence of that liquid may constitute in the sting of the culex mosquito an appropriate soil for the development of the yellow fever germ, whereas the same germ would remain sterile in the sting of other species of culex.

Another objection of a clinical character was made to our considering as cases of mild yellow fever the attacks of non-albuminuric fever observed in our inoculated subjects, either within the plausible limits of incubation or later on, with the result of rendering them immune against subsequent attacks of albuminuric yellow fever. To this objection an answer is given by the present statistics themselves, inasmuch as among fifty-six inoculated and non-inoculated subjects mentioned therein and who have resided during periods varying between three and seven consecutive years in the city of Havana, *one-half* have acquired their immunity exclusively through non-albuminuric attacks suffered during

the first three years after their arrival here. If the objection turned out to be well grounded, it would only prove that what we had considered as a partial immunity had been a complete one in ninety per cent. of our inoculated subjects.

I have distributed our sixty-seven inoculated subjects into six groups:

GROUP I. Fifteen—whose observation is yet incomplete, not having resided three years in Havana, nor experienced any form of yellow fever.

GROUP II. Twelve—who experienced, within a period of days varying between three and twenty-five, after the inoculation, an attack of fever with or without albuminuria.

GROUP III. Twelve—who did *not* experience any pathogenic effects within the twenty-five days following the inoculation, nor any other febrile attack subsequently, that could be referred to the yellow fever infection.

GROUP IV. Twenty-four—who did not experience pathogenic effects within the twenty-five days, but subsequently had fevers of a mild type, either non-albuminuric or with slight or transient albuminuria.

GROUP V. Three—who experienced no pathogenic effects after the inoculation, but were subsequently attacked with regular albuminuric yellow fever (severe in two cases), but recovered.

GROUP VI. One—who not having experienced pathogenic effects after the inoculation, was attacked some months later, and after exposure to an infection of unusual intensity, with fatal yellow fever.

After excluding the fifteen incomplete observations of Group I., fifty-two cases remain to be considered which may be conveniently arranged under three heads:

Mild acclimation (Groups II., III., IV.) .	48 cases	= 92.2	per cent.
Acclimation with regular yellow fever—			
cured	3 "	= 5.9	"
Fatal yellow fever	1 "	= 1.9	"
	52		

The next point was to obtain reliable data for comparison. I was fortunate in receiving from two religious communities placed under my medical charge the authorization to practise my inoculations on such members as would be willing to submit to them. These communities are those of the Jesuit and Carmelite Fathers, established in the city of Havana. Their members are partially renewed almost every year by the arrival of new-comers from Spain to substitute others who have resided several years here. Since 1883, every year except 1885 I have inoculated some of the new-comers, while others did not go through that ordeal. During the period 1883–1890 the Jesuit Fathers have had thirty-six inoculated and seven not, and the Carmelites had thirteen

inoculated and twenty-five not inoculated. Of the inoculated none have died of yellow fever, whereas five of the non-inoculated have died of it (one Jesuit and four Carmelites). After deducting from the inoculated thirteen cases still under observation, we have thirty-three inoculated and thirty-three not inoculated members of the same communities, having arrived in the same years as the former, leading the same life and exposed to the same chances of infection.

	Inoculated.	Not inoculated.
Mild acclimation (Groups II., III., IV.)	31 = 94 p. c.	21 = 65½ p. c.
Acclimation with regular yellow fever —cured	2 = 6 "	6 = 19 "
Died of yellow fever—none of the inoculated, but of the non-inoculated	... ...	5 = 15½ "
	33	32

The conclusions which the above statistical results, together with the comparative observations, appear to justify are as follows:

1. The inoculations with one or two recently contaminated mosquitoes, in the manner practised by ourselves, is free from danger, inasmuch as the numerous trials which have been made have produced at most (in about 18 per cent. of our cases) a mild attack followed by immunity.

2. We must attribute to the influence of the inoculations with contaminated mosquitoes: 1. The mild acclimation observed in 94 per cent. of our cases, whereas the same desirable result has only occurred, *cæteris paribus*, in 65½ per cent. of the non-inoculated; 2. The reduction of cases of regular yellow fever to the proportion of 6 per cent. instead of 19 per cent.; and 3. That of fatal yellow fever to less than 2 per cent. instead of 15½ per cent., one single death from yellow fever having occurred among the sixty-seven persons inoculated by us since 1881 until the present date.

3. The contaminated mosquitoes appear to lose either partially or completely their contamination after they have stung healthy subjects; whereas the contamination appears to become intensified by successive stings of the same insect on yellow fever patients.

4. The inoculations performed during the colder season should not be considered to afford sufficient protection, but should be repeated on the approach of the hot season.

UREA AND SEROUS MEMBRANES.

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It has been known for years and has been a part of the clinical experience of all careful observers in this field, that in chronic Bright's disease, serous membranes in various parts of the body were attacked by inflammations and that these secondary conditions resulted often in the great distress or death of the individual. The pericardium became inflamed, serum accumulated and within a few hours the patient was dead. A sudden peritonitis would develop in an apparently convalescing person and the day of doom had come to the patient. An acute attack of pleurisy would set at rest another slowly tortured with the familiar dropsy, dyspnœa, and fluttering heart. Thus I might review the clinical history of many of these sufferers, and glance briefly at these inflammations in various and often remote parts of the body by way of illustration, but more than this mere mention I deem not necessary.

These inflammations at this time in the disease are doubtless due to a combination of causes, and are generally common factors with the lesion in the kidney. The waste-laden blood is carried to tissues which it has for a long period of time failed to supply with sufficient nourishment, and even the small morsel it now offers is so mixed with the offending excrementitious products that they are not able to assimilate it. The bloodvessels themselves have undergone an atheromatous degeneration that, together with the contracted arteries, causes such increase of blood-pressure that the heart has enlarged and still fails in its irregular efforts to supply the necessary nourishment. No great wonder, then, that these highly vascular and therefore most imposed upon membranes should cry out with pain and even finally succumb.

It is well known from an extended observation both of the clinical features of this disease and of the many carefully recorded tests of the excretions from the kidneys, that the excreted urea which such organs eliminate in constantly diminished quantity is, when taken with the other symptoms, the most reliable guide in diagnosis, even though the patient be passing albumin and casts. It is also known that this same relation holds good in cases not passing albumin and casts, and that the severity of the clinical features of the disease can be determined often by a knowledge of this excrementitious product, after many recorded tests have been made, without the presence of the patient.

The purpose of this paper, therefore, is to recite cases which, to my mind, make clear that serous membranes are not only involved in inflammation during the pronounced evidences of Bright's disease, but that they are often involved seriously before the times of passing albumin and casts, and that these inflammations cannot be properly con-

sidered in a diagnostic way without a thorough knowledge of the amount of urea excreted daily for a long period of time for individual cases. Finally, these cases will show that these membranes are involved in the general disturbances which are now so indefinitely known to be associated with diseased kidneys, by the common knowledge of the clinical and excreted evidence.

Pelvic Peritonitis.

Case I.—In January, 1887, I was called to see a woman in great haste on account of some acute pain in the abdomen. She was about twenty-three years of age, well nourished, married; had had no children, or abortions; no history of gonorrhœa or syphilis. For some weeks past had had slight dyspnœa on exertion, with headache. She had no other history of disease and considered herself well to this date, with exceptions noted. Physical examination showed patient in recumbent position with legs flexed on abdomen, suffering from severe pain. Pressure upon the abdomen caused increase of pain. Slight distention of bowels with gas. Examination *per vaginam* of pelvic organs disclosed great tenderness in pelvic floor, with serous effusion, most marked in front and right side of uterus. Patient, after chilly sensations, had now a temperature of 103°; pulse firm and small, beating 120 times per minute. Had slight nausea and the characteristic face. Had been attacked without traumatic or other known cause a few hours before my visit, and was now anxious to be relieved from pain. One-third of a grain of morphia was administered hypodermically and pain was allayed for several hours, after which morphia was taken by mouth to modify pain. The day following my first visit pain still continued more or less intense, unless under the influence of the anodyne. Examination *per vaginam* now disclosed more serous infiltration and consequently a more firm pelvic floor. Within a few days the characteristic "deal board" hardness and fixation of uterus was established and pain began to subside slowly, with frequent exacerbations, and terminated in recovery by slow absorption, which extended over a period of several weeks. At the close of this period patient still complained of headache, slight nausea, dyspnœa on exertion and general weakness, although she had apparently recovered her former health. Examination of her urine at this time showed no albumin or casts, after repeated trials, but the quantity of urea excreted in twenty-four hours ranged from twelve to eighteen grammes within this interval, and patient again, after six months from first attack, and soon after these examinations, lapsed suddenly into her former condition of pain and serous effusion. It now occurred to me that there was an intimate relation between the diminished quantity of urea excreted and this inflammation, as other parts of the history were negative, and in addition to the hypodermic injection of morphia I gave a second hypodermic of pilocarpine, which caused free perspiration, and this was followed by an active saline cathartic, which was repeated within twenty-four hours, and the bowels were thoroughly emptied. After three days of this kind of treatment hostilities on the part of the peritoneum had ceased, and what promised to be a more serious attack than before, terminated thus abruptly. After this experience it was determined to try, as far as possible, to avert another attack by giving attention in the interval to the excretions. Nitro-

glycerin, saline cathartics, and sudorifics were vigorously used until the normal standard of from twenty-five to thirty-five grammes of urea was excreted daily and the patient so far recovered her health as to claim to be entirely well. At this time she became pregnant, and during the whole of her pregnancy she protested herself well; although I repeatedly inquired concerning her health and warned her of her probable troubles at delivery, she did not feel that she had any distress that she could not easily attribute to her condition. At about the eighth month of gestation I was called to her confinement, and after three hours of fruitless efforts, while the os was yet but slightly dilated, she had the first convulsion and continued unconscious until the child was delivered, having three other convulsions in the interim. At this time the urine showed no albumin or casts, but only 9.6 grammes of urea within twenty-four hours were excreted. Patient recovered rapidly on saline cathartics and former remedies, and since that time, May, 1889, has had but one or two slight attacks of peritoneal pain, and is well, so far as appearance and urinary tests can discover, except having a mitral regurgitant murmur, developed at or near the time of confinement, with slight enlargement of the left side of the heart. As repeated examinations of the chest were made before that time, I know the date of its appearance, and it may be well to state that no history of rheumatism can be obtained.

Case II.—Mrs. B., aged forty, married, had had five children, no abortions. Had no history of gonorrhœa or syphilis. Had had several attacks of what a physician had called "bad misplacement of the womb," accompanied with very severe pain, before my visit. Attacks extended over several months; she was hardly up until another seizure. Before this visit had not had an attack for a month or six weeks and was in a fair state of general health. Now she had excruciating pain in region of pelvis, with knees flexed against abdomen, with increased pulse and elevated temperature. Examination *per vaginam* revealed a very tender pelvic floor with slight serous effusion on right side of uterus, which advanced from day to day, producing general hardness. As all other causes for this condition were absent, I examined the urine, to find that patient passed only 7.2 grammes of urea in twenty-four hours. Albumin and casts were never found in her urine. In ordinary fever, following acute conditions in other parts of the body, and in cases of pelvic peritonitis from other causes, urea is increased in amount. After anodynes to relieve pain, pilocarpine, saline cathartics and diuretics were used vigorously and patient made a rapid recovery. A careful record of her examinations now shows an ebb in the urea excreted, and a renewal of her former attacks, which gradually grew lighter, until, when she removed from observation, she had not had an attack for almost a year, and was apparently well, excreting from twenty-three to thirty grammes of urea in twenty-four hours.

Two other well-marked cases have come under my observation as still further illustrating these conditions, and I no longer have any doubt of the relation of these factors. One of these cases has had repeated attacks and always at the ebb of urea excretion, promptly recovering under the treatment suggested, and thus can be prevented, for long intervals, from having even slight attacks. I do not want to be considered as saying that any considerable part of the whole number of cases of pelvic peritonitis is due to this cause, but I do mean to say that such

cases are frequently enough met with, even in a limited private practice, to cause a very serious reflection on the part of the profession.

Pericarditis.

Case III.—In August, 1889, I was called to a man, twenty-six years of age, who was found unconscious in a water closet the previous day; had been seen by other doctors and pronounced a case of morphia poisoning. Patient was of good habits, and had no history of syphilis, rheumatism, or indeed any disease, except a profuse diarrhœa for a day or two previous, for which morphia had been taken. Examination now showed patient to be profoundly unconscious, pupils slightly dilated, pulse 110, respiration 20, slight twitching of muscles in forearm, temperature 100°. Examination of urine showed no albumin or casts, but patient passed only 9.6 grammes of urea in twenty-four hours. Saline cathartics and diuretics soon caused patient to rally, and when otherwise apparently well he still complained of the usual dyspnœa, vertigo, nausea and insomnia at times, and a record of his excretions showed at such times a very small quantity of urea excreted. At no time did he pass albumin or casts, although very frequent examinations were made. Patient was a candymaker, and went to work at his trade, against advice, in a neighboring town in last November. In January of this year he returned to the office again, suffering from what he called a bad cold, which was really another explosion of disease. Records show at this time ten grammes of urea, dyspnœa, vertigo, vomiting, twitching of muscles over body, and within two days pericardium began to fill with fluid, heart beat muffled and 110 times per minute, temperature 101°, respiration 26, dizzy and soon became unconscious, and within the night died. Post-mortem showed chronic interstitial nephritis and pericarditis with extensive effusion.

Case IV.—This was a man, sixty-five years of age, well nourished; no history of syphilis or rheumatism; had considered himself well until within a few weeks of this consultation. Had had within this time dyspnœa, exhaustion on slight exertion, dizziness, and nausea. Had, at this first visit, a temperature of 102°, pulse 100, which had been preceded by a slight chill. Had slight distress in chest, accompanied by dyspnœa. Examination of the chest revealed an inflamed pericardium with slight effusion. The effusion during the succeeding days became very pronounced and caused quite uncomfortable dyspnœa and interfered with the heart's action. Not wishing to grant the idiopathic origin of this disease in this case and not finding another alternative, I, remembering Case I., examined his urine, to find no albumin or casts but that he passed only eight or ten grammes of urea in twenty-four hours, and that this condition extended over several days, contrary to the rule in idiopathic cases, which pass large quantities of urea. Indeed this case had almost fallen into obscurity by simulating to belong to such a class. Two other attacks followed this one within the following year and were marked by small quantities of excreted urea. The first of these was lighter than the original, and the last was lightest of all. The treatment from the beginning was nitro-glycerin, diuretics, saline cathartics, and sudorifics. The vertigo, general weakness, nausea, and dyspnœa that at first distressed patient during the intervals, gradually subsided, as excretions improved, until patient now considers himself well, as he has not had an attack of pericarditis for almost two years and the other symptoms are almost entirely relieved.

Two other well-marked cases of this variety have come under my care with similar results.

Arthritis.

The relation between serous and synovial membranes is so close that I relate two cases of extensive inflammatory conditions in these membranes, as I believe them to be connected with this subject:

Case V.—A man, twenty-one years of age; had no history of rheumatism in parents; had not had syphilis, gonorrhœa, or any serious illness until four years ago, when the present sickness began; had no bad habits—neither drank nor chewed; married, had healthy child. Had always been a farmer in easy circumstances. Four years ago had an attack of so-called rheumatism, vertigo, and general malaise. Joints of lower extremities at this time were swollen and tender; could not walk for several days, and suffered at times with them. Was treated for rheumatism in a neighboring town, and after several weeks recovered. At the same time dyspnœa and the other symptoms passed off and patient resumed his occupation, occasionally relapsing into the condition of dyspnœa and other similar symptoms. Two years ago he had a similar attack to that first mentioned and it ran an analogous course; apparently recovered, with exceptions of general weakness and dyspnœa on slight exertion. Last January I was consulted and made the following record: Joints of lower extremities slightly tender, but not much swollen, and no concretions on motion. Legs were slightly œdematous between articulations, and this had been much more marked, patient thought, during former attacks. Had marked dyspnœa, dizziness, and nausea. Had insomnia and malaise. Symptoms had been increasing in severity for the past ten days, and he feared one of his former severe attacks. The history caused me to examine the urine. I found neither albumin nor casts, but he was excreting only ten grammes of urea. Heart and other organs healthy, except slight roughness of mitral valves. The treatment before mentioned several times in this paper averted what promised to be a serious attack, and after a few weeks all distressing symptoms were gone and patient considered himself entirely well. All medication for rheumatism had not relieved any of these symptoms promptly, and some remained constantly. Patient went to Nebraska to follow his calling and consequently passed out of my charge. During the summer had another attack, and, from what I can learn from the family of his symptoms, must have died from chronic disease of kidneys, accompanied with many of former symptoms.

Another well-marked case of this kind of inflammation is now under observation—a woman, aged twenty, who has not walked for more than a year. Joints are tender and slightly swollen, but the intervening tissue is much more so. There are no concretions in the joints, no thickening of ends of bones. She has the accompanying symptoms of dyspnœa, nausea, vertigo, and a feeling of general weakness, with pale lips. Muscles are not atrophied; heart, lungs, and other organs healthy. Has no history of rheumatism, syphilis, or gonorrhœa. Parents healthy. Patient has been treated for past three years for these relapsing attacks, and is now an invalid. Examination of urine shows that patient passes but twelve to fourteen grammes of urea daily. No albumin or casts or other evidence of disease of kidneys, save those noted

above. Patient has been under observation but two or three weeks, and under saline cathartics, sudorifics, and diuretics, she is rapidly improving and gives promise of walking again soon, after having been confined to the house for over a year, and having been treated for rheumatism by six or seven doctors, with all the nostrums known to the profession, without avail.

ENDARTERITIS.

CASE VI.—In April, 1886, I was called to see a woman, sixty-five years of age, who for several months past had been "gradually growing worse," as she states. Had now vertigo, blindness, nausea, and general weakness; could not walk about home without great exhaustion. Had no history of either rheumatism or syphilis in herself or parents. Did not drink alcoholic beverages. Had to be in bed at times because of irritable heart and extreme dyspnœa causing much exhaustion. Had intercostal pain and headache at times. Passed at this time but 6.7 grammes of urea in twenty-four hours. On diuretics and saline cathartics patient improved in a short time and was able to do some work and be out of doors. Urea excreted in four months after first visit amounted at one time to twenty-four grammes in twenty-four hours, and patient was comfortably well. In December, 1886, she had another explosion of former symptoms, which came on suddenly, and in addition to old symptoms had delusions and hallucinations. Same treatment again seemed to improve patient, but one night she slipped from the house and drowned herself in the river which flowed near by. Post-mortem showed extensive atheromatous degeneration of bloodvessels in head and many other regions of body. Kidneys were slightly smaller than normal, but gave no more evidence of disease than other organs, and bloodvessels were not as much changed here as elsewhere.

CASE VII.—In September, 1886, I saw a woman, forty-six years of age, who had no history of rheumatism or syphilis; the mother of several healthy children; had been for several months distressed by headache, vertigo, nausea, great dyspnœa upon slight exertion, intercostal neuralgia, and general weakness. Examination of urine at this time showed no albumin or casts, but she passed only 4.1 grammes of urea in twenty-four hours. Within two months she grew apparently better. Passed 19.2 grammes of urea, but passed trace of albumin with casts. Within the year following she developed marked insanity. At this time the radial arteries were atheromatous. The heart was slightly enlarged and with an irregular effort was doing the best service it could. Patient was sent away and died, therefore no post-mortem was made; but I have no reason to doubt the diagnosis.

CASE VIII.—A man, fifty-nine years of age; had always been healthy until about a year previous to my seeing him in July, 1886. Had no history of rheumatism or syphilis. Had healthy family of children. Drank no alcoholic beverages. Had a continuous aching in lumbar and intercostal regions, together with occasional nausea, vomiting, dyspnœa, and vertigo, which had continued for several months with varying severity. Had atheromatous condition of radial and temporal arteries. Passed from 12.7 to 15.2 grammes of urea in twenty-four hours for several weeks. Appetite generally good. After several months in this condition he had a sudden paralysis of left side, and after some months more without relief from symptoms he had another stroke, from which he finally died. No post-mortem, but no question remains of the generally diseased condition of bloodvessels.

Three or four other cases with similar histories are upon my records of the past six or seven years, and I have no doubt of the pathological changes underlying these clinical pictures, nor have I grave doubts of the steps leading up to this final fatal conclusion.

CASE IX.—A clergyman, sixty-eight years of age; always an active man; never had any constitutional disease but this. Has always maintained the dignity of his profession, and is the father of several healthy children. About one year ago he began to be dizzy. Had slight dyspnœa on exertion. Has now irregular heart action. Sometimes it beats only forty times per minute for several days in succession, and quite irregularly even then. Has hardened radial arteries, slight vertigo, and insomnia. Passes only twelve to eighteen grains of urea in twenty-four hours. Passes no albumin or casts, and careful physical examination reveals to my mind no other diseased organs or tissues.

This man is still under my care. What can I tell him and his friends will finally befall him? Will he die of apoplexy, Bright's disease, endarteritis, or a combination of these, if no other disease intervene? He evidently is now at the point where all these roads meet, and it is still an open question on which one the fell destroyer will most rapidly make his approach, after he has been retarded as long as possible by the use of drugs. What shall I name this hydra-headed disease? Meigs styles it endarteritis. If in a short time he passes albumin and casts, in accordance with what Bright said many years ago, all practitioners now would unite in calling it Bright's disease. If he die from pericarditis, pleurisy, or peritonitis, without passing albumin or casts, they could not be called secondary to a primary Bright's disease; nor with this general evidence, together with the excreted evidences of ill-health, could we say that these diseases were idiopathic. We therefore need a new name that shall cover these symptoms of disease. We have abandoned dyspnœa, vertigo, and dropsy in our list of diseases, and have placed our outposts but a little further into the darkness which surrounds this whole subject, and now the facts that are brought to light from beyond these distant landmarks are demanding new names for the newly discovered conditions that shall take into account the full connotation of the term. During the time of Bright there were vaguely grouped several acute and chronic affections of the kidneys, which had in common one important characteristic—that the urine contained albumin. Almost every year since that time changes have been made in the classification to more nearly correspond to the pathological conditions, until it was discovered that patients could have otherwise this identical disease without passing albumin, and finally even albumin is beginning to be lost sight of in our rapid march toward the source of all these symptoms.

In endeavoring to find the first departure from health in the direction of these extensive after-changes in vessels, organs, and tissues, many theories have been advanced, and are of importance only so far as they can be incorporated into the clinical conditions of these patients.

George Johnson believes that chronic Bright's disease is a constitu-

tional malady, as shown by a morbid condition of the blood, which causes changes in the secreting cells of the kidney, and then finally to changes in bloodvessels in kidneys and other organs. DaCosta and Longstreth believe that there are lesions of the renal nerve plexuses and possibly in other ganglia that should lead finally to these extensive changes in the kidneys. Semmola believes it to be a morbid change in nutrition, and that the kidney changes are due to a constant excretion of albumin. Gull and Dutton believe these extensive changes to be due, as a primary factor, to a fibrosis of the arteries and capillaries. Meigs has made perhaps the most lasting guess by first basing it upon a most worthy study of numerous pathological specimens of arteries from the different classes of these patients, and he inclines to the belief that the initial step is an endarteritis of many or few of the bloodvessels, which in the beginning or after a longer or shorter time may, and probably will, involve the arteries of the kidneys. Thomas believes that some irritating substances in the blood, as alcohol, large quantities of phosphates, urates or uric acid, lead, and oxalates, have a tendency, after a long time, to produce the contracted kidney.

If, now, anyone who has made a careful study of this whole subject, with ample clinical advantages and without bias, should be called upon to decide from these views and many others which might have been named, I am inclined to the belief that no decision could be reached as to who was most nearly in accord with all the observed phenomena of these diseases. The want of a constant sign that would be unvarying in its relation to the clinical evidence on the one hand, and the pathological changes on the other, seems to me to be much more important. It is with this object in view that I have tried to show the intimate relation which seems to exist, under all these varying conditions of this many-sided disease, between the abnormally small amount of urea excreted and these serous inflammations which precede, accompany, and follow Bright's disease. If I should be led to express a purely fanciful notion of this relation, I should be compelled to say, for want of a more plausible explanation, that urea is in some way the cause of these inflammations, or, the cause of the suppression of this excrementitious product causes such inflammations. I am inclined to this view, as the same clinical evidence exists in the patient in a more mild form, but still pronounced, as is well known to exist in some of its forms in toxic conditions resulting from an undeniable uræmia, and because at the other extreme we find this clinical evidence in very close relation to the excreted evidence before any visible sign of inflammation has begun, and are enabled to follow these patients until the first serous invasion has taken place in an apparently healthy, well-nourished, young patient oftentimes, as shown by my tables published in THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES, January, 1890.

REVIEWS.

A Practical Treatise on Fractures and Dislocations. By Frank H. Hamilton, M.D., LL.D., Surgeon to Bellevue Hospital, New York. New (eighth) edition, revised and edited by Stephen Smith, A.M., M.D. 8vo., pp. 832. Philadelphia: Lea Bros. & Co., 1891.

The eighth edition of Dr. Hamilton's well-known treatise has been improved in practical value by the judicious revising and editing of Dr. Stephen Smith, of New York, and still retains its old position, which is that of the most comprehensive and reliable work upon this subject in the English language. With the possible exception of the section on fractures contained in Agnew's *Surgery*, there is no other teaching on the subject which combines accuracy of statement, fulness of detail, and sound practical judgment as does this work.

In looking over it for evidence of the contributions of the present editor the following seem worthy of mention:

Dr. Smith quotes, with approval, the opinion of Dr. William Hunt, in reference to active and prompt laryngotomy or tracheotomy after fractures of the cartilages of the larynx, and adds the suggestion of Pick in relation to the employment of Trendelenburg's tampon-canula to aid in maintaining the cartilages in position after they have been restored.

In reference to fractures of the vertebral arches he quotes the cases of Macewen, Horsley, Gordon, and Dandridge, and adds: "Unsatisfactory as operations have thus far proved to be, there are exceptional cases in which they will prove useful. Macewen has thus expressed the opinion that is entertained by the most advanced surgeons on this subject: 'Traumatic lesions are, as a rule, so gross, and the destruction so complete, that in such operative treatment can be of little service. Still there are cases in which traumatism has produced localized pressure, primary or secondary, which can be relieved.'"

This can scarcely be regarded as entirely satisfactory in the face of the rapidly accumulating statistics of operations upon fractured vertebræ, showing a slight but progressive increase in favorable results. It is well, however, in a treatise intended for the guidance of the general practitioner, to err on the side of caution and conservatism.

In relation to fracture of the bodies of the vertebræ the recent results of treatment by suspension and plaster-of-Paris jacket are briefly discussed, and the experiences of König, Wagner, Burrell, and others are recorded.

The addition of the description of Bryant's ilio-femoral triangle is in our opinion of distinct value. We have found it in our own experience one of the most valuable methods of determining with the least possible disturbance of the patient the exact seat of a shortening known to exist somewhere between the ilium and the condyles of the femur.

The interesting observation of Dr. Sutton, of London, in reference to the etiology of Pott's fracture, is quoted with apparent approval: "Dr. Sutton notices the comparative length of the external malleolus in man and adds: 'If this malleolus in man is compared with that of mammals, which so closely approach him in anatomical characters, it will be found to descend much lower.' He states that no one has ever described an example of Pott's fracture in a monkey, nor, indeed, in any mammal save man; he concludes that Pott's fracture is peculiar to the human kind, and occurs as a distinct result of the extraordinary length of the fibula malleolus, in that it affords excessive leverage when the foot is suddenly and violently twisted laterally, the force applied to the distal end causing the fibula to snap at some point in its lower fourth."

In reference to the correction of deformity after badly set Pott's fractures, the methods of Erichsen (subcutaneous division of the fibula and forcible adduction); Le Dentu (refracture and the employment of an osteoclast); Fenger (removal of a piece from the tibia and re-fracture of the fibula); and Sabine (subcutaneous osteotomy of both bones) are detailed.

In 1888 we saw in the wards of Professor Lister, in London, an interesting case which, in a letter to *The Medical News*, we described as follows: "One of the most striking cases which I saw was an operation for the relief of the deformity caused by badly treated Pott's fracture. The fibula had been broken at the usual point, and there had also been a fracture through the base of the external malleolus; the foot was so greatly everted that the limb was absolutely useless to the patient; this condition had persisted for more than a year. At the operation the soft parts were turned forward down to the bone by an incision following the posterior border of the fibula and of the external malleolus; the fibula was divided at the point of fracture, the triangular space existing between the lower edge of the fibula and tibia, which was filled up with fibrous material of almost bony hardness, was cleared with the gouge, chisel and sharp spoon; the soft parts over the internal malleolus were then turned forward by a similar incision, and the mass of new bone, which was easily recognized, and which filled up the gap between the two fragments of the malleolus, was chiselled away. After this the application of considerable force by means of pulleys brought the foot suddenly, but perfectly, into position. The subsequent course of the case was absolutely uncomplicated, and the patient, at the end of three weeks, already had considerable motion without pain in the ankle-joint."

We have recently done practically this same operation in a patient who had a similar deformity and with most excellent results.

In reference to dislocation of the acromial end of the clavicle upward Hamilton gives the usual unfavorable prognosis. The editor adds a description of the ingenious dressings employed by Dr. Powers, of New York, and Dr. Pilcher, of Brooklyn. We have had two cases, in both of which by the application of a dressing resembling these we have succeeded in getting an almost perfect result. In one of them, now more than eighteen months old, no difference between the shoulders is discoverable. In the diagnosis of this dislocation it may be useful to note that the vertical circumference of the shoulder is slightly increased, but to a less extent than in dislocations of the humerus; that the distance from the acromial end of the clavicle to the external con-

dyle is increased, and that the distance from the same point to the suprasternal notch remains unaltered.

Unfortunately, like most other surgeons, we have had a much larger number of cases in which permanent disability of moderate extent resulted. Dr. Smith gives the following excellent amplification of Hamilton's statement that in compound dislocation the treatment should include "a judicious employment of antiseptic precautions and of drainage." The rule of practice should be as follows: "1. Determine the amount of injury which the structures about the joint have sustained. If the vessels and nerves are so far uninjured that the limb can be saved, determine upon reduction or resection. 2. In either case cut away tissues so bruised or torn that death is likely to ensue. Disinfect all the exposed surfaces with hot sublimate solutions (1 : 4000), the water being injected forcibly with a bulb-syringe. The solution should be of a temperature of not less than 130° to 140°, or so that the hand can scarcely be retained in it. If of the proper temperature the irrigated tissues will be changed to a dull-gray color. The greatest care is necessary to force this solution into every part of the joint, and among the tissues. 3. Reduction or resection should now be effected with little strain upon the tissues. 4. Ample drainage should be provided, the drainage-tube or tubes extending to every recess. 5. The wound should be closed by the union with suture of all divided tissues which can be brought into easy apposition. 6. Antiseptic dressings, enveloping the parts sufficiently, should be applied; and to maintain rest a plaster-of-Paris dressing may be required, as at the knee or ankle. These dressings should not be changed for three or four weeks, unless there is evidence of disturbance in the wound. The tubes should be removed in four or five days by opening fenestra where they are located."

All this seems very sound, the only criticism which suggests itself to us being the direction to leave the dressings undisturbed for three or four weeks, unless there is evidence of trouble in the wound. It is certainly true that in the great majority of cases a safer routine method would be to inspect carefully at an earlier date than this, with, of course, all possible precautions as to unnecessary movement.

Many valuable additions have been made in almost each chapter of the book, and we may repeat our hearty indorsement of it as a safe and reliable guide to the general practitioner. J. W. W.

DE LA MALARIA. Par DR. EDOUARD PEPPER, L.F.P., Algiers. Précédé d'une Introduction par M. LE PROFESSEUR PETER. Paris: G. Masson, 1891.

A CONTRIBUTION TO THE STUDY OF MALARIA, AS OBSERVED IN ALGIERS. By DR. EDWARD PEPPER, L.F.P.

THE author of this interesting volume is an American physician of recognized attainments in France, who having won distinction in the Franco-Prussian war, and being in impaired health, has made Algiers his residence. He has profited by the opportunity there offered to study malarial infection, and dedicates his treatise to his friend Professor Peter, of Paris.

In his introduction, Professor Peter emphasizes the fact that the patient's peculiarities influence very greatly the course and symptoms of his disease. He regards the malarial germ as an accompaniment, but not as the cause, of the disorder, and supports this opinion by an extensive clinical observation.

Dr. Pepper precedes his account of malaria as seen in Algiers, and its treatment, by a description of the country from the standpoint of the medical scientist, and the narration of the circumstances which led to an epidemic of malarial infection which came under his observation. He states most explicitly the best hygiene for foreigners living in Algiers, and this portion of his book cannot fail to be of great interest and value to any who may visit the country.

In the prophylaxis of malarial infection he has found precautions as to diet, clothing, and bathing of importance; also the use of a few drops of an arsenical solution, taken with coffee or any agreeable beverage, when the patient is fatigued.

His description of the symptoms of severe malarial infection is excellent, and might well be incorporated in standard works on diagnosis.

In the treatment of malaria in infants, he has found hydrobromate of quinine of use in early infancy; the hypophosphite in older children, and the valerianate in girls approaching puberty. The author writes fully regarding his use of quinine in adults, discriminating between the different salts and indications for their use. He has not often exceeded sixty grains in twenty-four hours in ordinary cases; in pernicious malarial infection he has given fifteen grains of the acid hydrochlorate hypodermically, accompanied by forty-five grains of the sulphate by the stomach at the same time.

In what is styled "bilious remittent" malarial infection, he has had good results from rectal injections of carbolic acid, with hypodermics of quinine, giving from fifteen to thirty grains of carbolic acid in twenty-four hours. Arseniate of strychnia with quinine is of great value in the profound nervous depression which accompanies severe infection. The author's formula, which has been adopted by the marine service of several tropical countries, is as follows:

℞.—Sodium arseniate	gr. 3
Strychnia sulphate	gr. 1½
Distilled boiled water	fl℥10½

To be used without filtering.

In the hypodermic use of the acid hydrochlorate of quinine he has found the best formula fifteen grains of the salt to half an ounce of saturated camphor-water, freshly prepared. In briefly mentioning these points we merely indicate to our readers some of the many instructive details which Dr. Pepper incorporates in his interesting treatise. The clinical histories in full of sixty-four cases form the basis of his deductions regarding treatment, and illustrate his methods.

We are interested to know what definition of malaria an acute observer like the author, placed in such favorable conditions to study malarial infection, may formulate of this common but not clearly defined malady. He states (p. 280): "Malaria is an infectious, feebly contagious malady, caused originally by telluric action, assisted by meteorologic influences affecting the electric status of the body and the nervous system; the infection gains access to the blood through the respiratory

organs, less often through the digestive tract." The book is handsomely published, and will adorn and enrich the library of the physician or the traveller. E. P. D.

PRACTICAL TREATISE ON ELECTRICITY IN GYNECOLOGY. By EGBERT H. GRANDIN, M.D., Chairman of the Section on Obstetrics and Gynecology, New York Academy of Medicine; Obstetric Surgeon, New York Maternity Hospital; Obstetrician, New York Infant Asylum, etc., and JOSEPHUS H. GUNNING, M.D., Instructor in Electro-therapeutics, New York Post-Graduate School and Hospital; Gynecologist to Riverview Rest for Women; Electro-gynecologist, Northeastern Dispensary, etc. Illustrated. Pp. 171. New York: William Wood & Co., 1891.

THE appearance of a new monograph upon the application of electricity to diseases of women is a proof of the importance which this therapeutic agent has assumed in gynecological treatment. In reviewing in this journal the recent work upon the same subject, we took occasion to question the advisability of recommending the use of what may be called the refinements of electro-therapeusis by the general practitioner, and we are still of the opinion that even gynecologists who have not made a special study of the theory and practice of electrolysis, and are provided with all the expensive apparatus necessary for its proper application, ought to refer their patients to an expert who is prepared to make a rigid scientific test of the method. The statistics of tyros in this department are valueless from a scientific standpoint; they only serve to place the subject in a false light before the profession. It is fair neither to our patients nor to medical science for us to employ electricity simply for "effect." In no other branch of therapeutics is it so true that "a little knowledge is a dangerous thing." Of all the manuals on this subject which have appeared, we regard the present one as the safest and most conservative. "The agent is considered," we read in the preface, "not from the standpoint of a specific, but as a valuable adjuvant to routine therapeutic methods"—a claim to which no fair-minded man can take exception.

The first chapter, including nearly one-third of the book, is devoted to a discussion of theoretical questions and descriptions of apparatus, and is unusually well illustrated. The brief closing paragraph on contra-indications to the use of electricity might with propriety have been extended to several pages; it is extremely important for the general practitioner to learn clearly in exactly what class of cases electricity should *not* be used, though we doubt if any but an expert gynecologist is really competent to recognize this at the examining-table.

Chapter II., on "Routine Uses of Electricity," will undoubtedly prove of the more practical value to the ordinary reader than will the succeeding carefully elaborated chapter on "Electrolysis." We are glad to see that the authors regard dysmenorrhœa rather as a "symptom complex," than as a single symptom referable purely to a gross local lesion or abnormality. It is only by viewing the subject in this way that we can understand the undoubted analgesic effect of the continuous current. The point is made that the tension faradic current, with the bipolar intra-uterine electrode, is not to be used indiscriminately,

but only "where the flow is scanty and insufficient stimulus is a probable source of the dysmenorrhœa." Stress is laid upon the fact that the galvanic current, when used in cases of chronic oöphoritis accompanied by severe local pain, simply relieves the neuralgia, but does not exert any miraculous curative effect upon an ovary which is the seat of actual organic disease. While affirming that the proper application of electricity restores tone to the relaxed supports of a displaced uterus, the authors do not share in the enthusiasm of some electro-therapeutics, who claim that displacements can be cured by this agent alone. "A fact to be emphasized is that the use of electricity does not, as has been claimed, enable us to dispense with pessaries."

The section on the electrical treatment of diseases of the adnexa ought not to give offence, even to the avowed opponents of conservatism, since the authors simply plead for a fair trial of this agent before resort to abdominal section. "To make one of these suffering women comfortable," they conclude, "if not to entirely cure her, by means of electricity, redounds more to the credit of the gynecologist than if he sterilizes her and still does not cure her."

To those who desire a lucid statement of the theory and practice of electrolysis for uterine fibroids we commend Chapter III. So much that is obscure and confusing to the general reader has been written on this subject that it is gratifying to have the entire matter satisfactorily explained.

A monograph written by two individuals must necessarily be somewhat uneven. In the one before us, however, the dual element is seldom noticed, each author adhering to his one line of work. The style is clear, unpretentious and effective. The book is an honest book by honest men, and, as we said before, can be relied upon as a safe guide to the inexperienced, while the specialist will find in it not a few useful hints. The illustrations are numerous, well-executed, and possess the rare merit of freshness. H. C. C.

Du Chimisme Stomacal (Digestion normale—Dyspepsie), par Georges Hayem, Professeur de Thérapeutique à la Faculté de Médecine de Paris, Membre de l'Académie de Médecine, Médecin de l'Hôpital Saint Antoine, et J. Winter, Preparateur du Laboratoire de Thérapeutique à la Faculté de Médecine de Paris. Pp. 274. Paris: G. Masson, 1891.

Chemistry of the Stomach (Normal Digestion—Dyspepsia). By Georges Hayem, Professor of Therapeutics of the Faculty of Medicine of Paris, Member of the Academy of Medicine, Physician to the Hospital Saint Antoine, and J. Winter, Preparator of the Therapeutic Laboratory of the Faculty of Medicine of Paris.

This little work embraces original researches in the chemistry of the stomach, in two principal parts. The first comprises the consideration of the normal, and the second of the abnormal chemical functions of the stomach.

After an exhaustive general review of the various chemical theories of the digestive process, in which great stress is laid by the authors on

the conclusions of Richet that the principal part of the hydrochloric acid is secreted and contained in the stomach as organic compounds of chlorine, they deal with a discussion of the methods of analysis of the gastric juice. The principal point of interest of this centres on the quantitative determination of free hydrochloric acid of the stomach. The method of Bidder and Schmidt they consider to be simply demonstrating that a certain amount of chlorine is present in the gastric juice otherwise than combined with mineral bases, also the quantitative results of Prout's researches as derived by his method of distillation, by which they claim the hydrochloric acid is by heat liberated from the organic bases it is combined with. The clinical results of Ewald and Boas they think illusory, and of qualitative value only, as the organic chlorine compounds are by them neglected. All the previous methods, qualitative and quantitative, they condemn as not taking into consideration the organic compounds of chlorine, which with them, as with Richet, appear to have become foregone conclusions, and a matter of the greatest importance in the chemical work of the stomach.

The authors describe at length and base their subsequent observations on the process of M. Winter, which we will describe here briefly, as it forms the principal point of the whole controversy on the subject. This method is intended to furnish: 1. The total chlorine; 2. The fixed chlorides (mineral compounds of Cl); 3. The difference between the two as hydrochloric acid, both free and in combination with organic matter; 4. The difference between the total of the two latter and the amount of HCl that can be dissipated by a temperature not exceeding 100° C., as the chlor-organic compounds.

The determination of the three values to be ascertained is by titration with the deci-normal solution of silver nitrate. Three specimens of 5 c.c. each of the gastric juice are obtained. To the first is added an excess of sodium carbonate, after which it is evaporated, and finally incinerated. The titration of this yields the total chlorine, to which they assign the letter T. The second portion is evaporated over the water-bath to dryness, and then for one hour more; the residue is mixed with sodium carbonate, incinerated and also titrated. This gives the fixed chlorides plus the non-volatile hydrochloric acid (organic chlorine compounds). This subtracted from the total chlorine (T) leaves the amount of free hydrochloric acid, termed H. The third part is evaporated and incinerated without addition of sodium carbonate. It gives on titration the fixed chlorides, designated as F. The third result, subtracted from the second, leaves the amount of chlor-organic compounds, including also *ammonium chloride.*

The authors claim that if carefully done this process will always give accurate and reliable results, which in their cases, with normal secretions, have been remarkably constant. It might seem that they had at last solved the Gordian knot, and presented alike an accurate and ready method for quantitative estimations of the HCl in gastric juice, as well as established the presence of HCl not volatile at 100° C., in excess of that fixed by mineral bases. The constancy of their results would also tend to make the organic chlorine compounds a factor of importance, and thus they would bring us at once to a new epoch in our knowledge of gastric chemistry, could they present to us also the evidence of the existence of their organic chlorine compounds in the *fresh*—*i. e.*, not heated and evaporated—gastric secretion. When they claim the results of Prout

as erroneous, owing to the liberation by heat of HCl from loosely combined organic chlorides, the same fault must inversely attach itself to their method, in so far as they may be said to *produce* the organic chlorine compounds in their process of analysis. While this is not proven, it certainly cannot be, or is not, disproven by them, as their principal factor upon which they base their conclusions is at best hypothetical. That there are in the gastric secretions albuminoid matters is not to be disputed; that these change under the effect of heat at and below 100° C. is another fact; that under such conditions bases form which combine with the free HCl of the gastric juice is very probable, and that their deduction therefore of an existence of organic chlorine compounds in the *fresh* gastric juice is not established becomes apparent.

The experiments of Prout and so many others are in fact much more conclusive, and lean toward the assumption that in the fresh gastric juice HCl is present in its free state. It might be said that the constancy of their value C (chlor-organic compounds) may be claimed in support of their theory, but this might as readily be explained by a constancy of the albuminoid matter in the gastric juice and the bases produced by their process of evaporation.

The chapter on the normal evolution of the gastric digestion is quite ingenious and interesting, but it is, after all, only a defence of their theory of the preëxistence of organic chlorine compounds in the gastric juice. They value the digestive power of the gastric juice by the relative proportion of the organic chlorine compounds with the abnormal (not HCl) acids. Thus they arrive at a formula in which A is total acidity, H free hydrochloric acid, and C organic chlorine compounds; these yield the digestive utility of the gastric secretion, as $\frac{A-H}{C}$, to which they give the term, and according to its decrease or increase over the normal, which they found as 0.86, they classify pathological peptic acts as respectively hyperpepsia and hypopepsia. These, in turn, they subdivide in three degrees, of which the last of the latter is equivalent to apepsia. They also give a class of simple dyspepsia, in which the peptic disturbance does not arise from a marked variation of the chemical values.

A most disturbing element in their deductions appears in speaking of the factors to which the total acidity of the gastric juice is due; they declare on page 105: "After our experiences, the free hydrochloric acid, the organic acids, and the acid phosphates present together a value which represents in the normal state but a small part of the total acidity. *The greatest part of the total acidity comes from the hydrochloric acid compounds with albuminoids in solution;*" whereas, on page 241, in referring to cases where the total acidity is nothing, and the organic chlorine compounds are given respectively as 0.055 and 0.202, they say, "While the total acidity is nought, the chloro-organic products are *deprived entirely of the acid function.*" If a factor for gauging the peptic act is subject to such abnormal qualitative conditions, it can, in our opinion, scarcely be classed as the controlling element of digestion; besides, it may be presumed, that in part, if not altogether, as most probably in the last cases cited, these organic chlorine compounds are principally ammonium chloride derived from the free HCl secreted in the stomach, acting during the evaporating process (by which it becomes concentrated) on the nitrogenous compounds of the gastric juice.

This volume is, however, a most remarkable one, full of original thought, and the casuistic presented shows an almost unparalleled industry on the part of the authors. Their lines of research are so entirely original that the perusal of their work is of the greatest interest to those who give more earnest study to gastropathies.

To admit that the authors are right in their premises would upset all present doctrines regarding digestion and its perverted state, and at once start a gastro-pathology, which, in its complications, would lead to utter confusion. We admit the brilliant conception and the laborious elucidation of the leading idea, which it seems hard to supersede in some of the great minds of the French medical schools. Ever since the hydrochloric acid digestion of albuminoids was proven there have been periodical attempts to prove the supposed existence of the organic chlorine compounds. So far this has not been done, and Professor Hayem leaves this point as problematical as it was after the researches of Richet.

To students of gastro-pathology we can recommend this little work as most interesting reading, though we differ essentially with the hypothesis it attempts to prove. L. W.

REPORT OF CARLOS F. MACDONALD, M.D., ON THE EXECUTION BY ELECTRICITY OF WILLIAM KEMMLER, *alias* JOHN HART. Presented to the Governor of New York, September 20, 1890. Pp. xx.

THE importance of its subject justifies a reference in these pages to this brief document. To those whose notions about the execution of criminals by means of electricity have been derived from the sensational romances of the daily press, this report will prove an excellent corrective.

The autopsy was held about three hours after death, but, with the exception of the local desiccation caused by too prolonged contact with the heated electrodes, nothing was discovered but the ordinary appearances produced by a fatal charge of electricity.

In spite of minor defects in the apparatus, and its mode of application, which were inevitable by reason of inexperience, it is the opinion of the distinguished reporter that—

"Compared with hanging, in which death is frequently produced by strangulation, with every indication of conscious suffering for an appreciable time on the part of the victim, execution by electricity is infinitely preferable, both as regards the suddenness with which death is effected, and the expedition with which all the immediate preliminary details may be arranged. . . . The execution of Kemmler, from the time he entered the room until the second contact was interrupted, occupied not more than eight minutes; whereas, executions by hanging usually require from fifteen to thirty minutes. In fact, it not infrequently happens that the heart continues to beat for that length of time after the fall of the fatal drop. Then, too, far more time is consumed in placing the prisoner on the gallows, pinioning his limbs, putting on the black cap, placing the noose about his neck, and carefully adjusting the knot under his left ear . . . than would be required for arranging the preliminary details of an electrical execution."

If anyone should still object to the alleged failure to annihilate existence at the first electrical contact, let him contrast the expedition with which the possible failure was corrected and converted into an unquestionable success, with the horrible delays that attend the replacement of a broken rope in execution by hanging. Contrasting the details of the present report with the records of execution by other methods, the electrical method has everything in its favor. Read, in the blood-stained annals of history, how in the agony of death, high-born noblemen and gentle women, breaking away from the block, have been chased around the scaffold by the executioner with his bloody axe, and have only been felled by a succession of blows upon the head, shoulders, and neck. Witness the frightful scenes of a military execution: bodies perforated with bullets, yet weltering in conscious pain until life is finally ended by the sergeant's merciful pistol-shot through the head. Nor does the expeditious work of the guillotine prevent horrible anguish on the part of the wretch who is hurried from his bed into the cold prison-yard at dawn of day, strapped to a plank, and shoved under the knife that severs his bleeding head from a struggling trunk. Rough and painful are the preliminaries of all these processes; whereas, in the case before us, the victim of the law was quietly and comfortably placed in a chair, with no terrifying apparatus in sight. One contact, and all possibilities of sensation and consciousness were instantaneously annihilated. He could not have known that he was dying. This, certainly, is a perfection of euthanasia that even anæsthetics and poisons cannot procure.

As a result of the experience acquired in this execution Dr. MacDonald recommends:

"1. The statute providing for the execution of criminals by electricity should be amended so as to provide for but one plant, to be located in the central part of the State, in a building especially constructed for the purpose. This building should contain the necessary electrical apparatus, an engine, execution-room, solitary cells, and quarters for the guards and other necessary officials, the apparatus to be in charge of and operated by a competent, accredited electrician.

"2. The engine and dynamo should be especially constructed for the purpose, and should be capable of generating an electro-motive force of at least 3000 volts, in order to insure the maximum voltage that would be necessary, and at the same time cause no injustice to any electrical lighting company, such as is likely to be the case so long as commercial dynamos are used in executing criminals.

"3. The volt-meter should be located in the execution-room, and a competent and responsible official should be detailed to take the readings of the meter before and at the instant the current is applied. The voltage should not be less than 1500 nor more than 2000, and should be a matter of official record. The prisoner's [electrical] resistance should also be taken immediately before bringing him into the execution-room.

"4. The statute should require an official report of each execution to be made to the Governor within ten days after the execution takes place." H. M. L.

PROGRESS

OF

MEDICAL SCIENCE.

THERAPEUTICS.

UNDER THE CHARGE OF

FRANCIS H. WILLIAMS, M.D.,
ASSISTANT PROFESSOR OF THERAPEUTICS IN HARVARD UNIVERSITY.

Treatment of Epilepsy by the Conjoined Employment of Bromide of Potassium and of an Agent Capable of Rendering the Nervous Centres Anæmic.

Under this head Poulet, of Plancha-les-Mines, in the last *Bulletin général de Thérapeutique*, writes of a combination of bromide of potassium with Calabar bean, which has given him success in the treatment of obstinate cases of epilepsy where the bromides alone had failed. A favorite formula of his is the following:

Bromide of potassium	100 parts.
Tincture of Calabar bean	35 "
Water	470 "

Dose: A tablespoonful, to be increased to a tablespoonful and a half, then two tablespoonfuls, daily.

A tablespoonful contains about fifty-seven grains of bromide, and about sixteen minims of the tincture. The medicine may be given in divided doses instead of in one full dose, half a teaspoonful being given at first twice, then three times, then four times a day.

Poulet reports five obstinate cases treated in this manner. These were cases where bromide alone failed to cure:

1. The fits were formerly six or eight a week (*grand mal*). After a year of the new treatment, no return of the epilepsy. In this patient the tincture of Calabar bean is occasionally replaced by eserine, in the dose of one-sixty-fourth of a grain to each fifteen grains of bromide; the result has been the same. No contraction of the pupil has been observed during the administration of the medicine.

2. A most obstinate case; had been epileptic for eight years, eight or ten fits a day. Failure of bromides, given alone, also of bromides and picrotoxine. Definitive cure under bromides associated with tincture of Calabar bean.

3. Also a case of chronic, inveterate epilepsy. Several months' treatment by the combination specified has given exemption from all convulsive accidents.

4. A case of grave epilepsy at the menopause. Frequent daily vertiginous attacks ending in convulsions and stupor. At first the disease was successfully combated by bromide of potassium associated with picrotoxine; this combination afterward failing, sulphate of atropine was substituted for picrotoxine (ninety grains of bromide of potassium and one-sixty-fourth of a grain of atropine daily). The latter treatment has been kept up for a year, with complete cessation of the vertigo.

5. A case of cardiac epilepsy. The *grand mal* attacks were followed by hemiplegia with stupor and hebetude (*état de mal*). A combination of bromide and digitalis caused disappearance of the epilepsy (120 grains of bromide associated with 30 minims of tincture of digitalis in divided doses daily).

Poulet terminates his article by the following conclusions:

The bromides remain the sheet-anchor in the treatment of epilepsy, and by the term *bromides* we have especial reference to the bromide of potassium, which alone is truly efficacious.

There are, however, a great many epileptics whose attacks are only mitigated or posponed, not completely suppressed, by bromide of potassium.

In such cases if we associate the bromide with some medicament which possesses properties identical with those of the bromide (that is, being capable of anæmiating and decongesting the nerve-centres and paralysing the system of voluntary muscles) we generally obtain results which are perfectly satisfactory in essential epilepsy, and even in partial or Jacksonian epilepsy, on condition that, in the latter, we begin by the specific treatment of the determining cause. The substances that have been most successful are Calabar bean, picrotoxine, and belladonna. In cardiac epilepsy digitalis must be added.

We may indifferently substitute sulphate of eserine for the preparations of Calabar bean, sulphate of atropine for those of belladonna, and digitaline for digitalis.

Some New Uses for Saline Preparations.

Dr. John Strahan points out some uses for saline preparations which would not be recalled to the minds of many practitioners.

Thus, in pleurisy it is known that salines produce an outpouring of fluid from vessels in the intestinal canal, as well as a greatly increased secretion from all the glands of the mucous membrane. Nothing better reduces abnormally high arterial tension, because, if the abdominal vessels are much filled, pressure must fall generally. Thus a saline purge will often relieve renal congestion, and thus act as the best diuretic. Even in the healthy a saline purge will often greatly increase the quantity of urine, although a great quantity of fluid has been discharged by the bowels. For such purposes

salines should be given in only as much fluid as will dissolve them. Their affinity for water must then be met by exosmosis through the intestinal capillaries. In some cases of general anasarca, whether cardiac, renal, or merely anæmic, the effects of a few half-ounce doses of sulphate of magnesium is very striking and can only be approached by puncture of the swollen leg. Such treatment is often of advantage in acute, subacute, or even chronic pleurisy.

The salines will act just as freely and as promptly in the case of a patient under the influence of morphine or opium as if such drugs were not present, which is often an advantage, and which can hardly be said of any other purgative. An ounce of sulphate of magnesium will produce a full watery movement in two or three hours, and without the slightest griping or pain, in a man who is narcotized by opium.

Milk diet is a valuable accessory to this method of treatment; so also in general renal and cardiac dropsy and anasarca the salines act as efficient diuretics by removing stasis of the renal veins, and in ascites from portal obstruction salines are still more useful, as they act directly on the organ concerned. The œdema of the lungs and œdema of the brain, which so often imperil life in Bright's disease, are usually more quickly and decidedly benefited than by any other plan of treatment, while it is known that free purging in cases of dropsy or anasarca is not followed by weakness and exhaustion, as it would be in other cases, or even in health. As a rule, it is best to prescribe the sulphate of magnesium in mixture with dilute sulphuric acid and extract of licorice, which quite disguises the taste. If the sulphate is ordered, four- or even two-drachm doses every four hours will cause a profuse but painless diarrhœa which is perfectly within the control of the medical attendant.

Again, in uræmic cases, and irritable and inflamed states of the stomach and intestines, salines may be freely and painlessly employed when no other purgative would be dreamed of, except, perhaps, calomel. The circumstances which exclude salines, with all other purgatives, are inflammation and probable perforation of the vermiform appendix, perityphlitis, and peritonitis from perforation. Fecal impaction and simple typhlitis are, on the other hand, strikingly remedied by salines when other purgatives may cause enteritis or peritonitis, while croton oil, jalap, senna, etc., cause violent excitation of the muscular coat of the bowels, and thus often intense pain in the bowels of the healthy. If the irritability of the stomach be so great that constant vomiting prevents the administration of salines through the mouth, they may then be given by enema, and two ounces of sulphate of magnesium as a purgative enema will be thoroughly satisfactory with its quickness, thoroughness, and its perfect painlessness. A good formula is: Sulphate of magnesium two ounces, glycerin one ounce, water enough to make four ounces; this is unirritating, and is perfectly reliable. The glycerin in this formula is undoubtedly a useful adjuvant; but while glycerin produces solid stools, the salines in the formula lead to the excretion of large amounts of liquid, and consequently a fluid passage. In stricture of the intestine, as in cancer of the rectum, nothing can equal salines which cause fluid stools—generally painless ones; for salines liquefy the feces, so that they may pass through the narrow gut without pain or straining, thus avoiding danger of perforation

or rupture. This also applies to all diseases of the rectum attended by difficult defecation, such as ulcers of the anus.

In lead colic, in acute dysentery, and in rectal and pelvic hemorrhage, especially if the latter condition is due to constipation, they may be used.—*Provincial Medical Journal*, vol. cx., 1891.

In Acute Bronchitis.

A simple expectorant mixture in acute bronchitis is:

℞.—Ammon. muriat. . . . . ℥ss.
Mist. glycyrrhiz. comp. . . . . ℥iv.—M.
Sig.—Take a dessertspoonful every four hours.

The dose is smaller in the extremes of life, and in severe coughs it is given every three hours.

Tablets of the muriate of ammonium and the compound licorice mixture are very efficient. When the secretions are with difficulty brought up, the use of senega is advised.

When the secretions are abundant and not easily coughed up, turpentine in emulsion is an excellent remedy, not so pleasant, perhaps, as terebene or terpine hydrate, but rarely failing to do good in properly selected cases. The formula, with occasional modifications to suit particular cases, is:

℞.—Ol. terebinthin. . . . . ℥ij. to ℥iij.
Mucil. acaciæ . . . . . q. s.
Aq. cinnamomi . . . . . ℥j.
Aquæ . . . . . q. s. ad ℥vj.—M.
Sig.—A tablespoonful in a little water every four hours.

Ofttimes the cough is of such an irritating character that these ordinary expectorant mixtures avail little; then recourse must be made to a narcotic in some form. Codeine, a very useful alkaloid of opium, has the advantage of not constipating as much as morphine. A good combination is:

℞.—Codeinæ sulphat. . . . . grs. viij.
Syr. prun. Virginian. . . . . ℥ij.—M.
Sig.—A teaspoonful in a little water three or four times a day and at bedtime if necessary.—*Therapeutic Gazette*, July, 1891.

Whooping-cough Treated by Atomization.

Dr. H. Ernest Schmid states that he now relies entirely upon atomization for the treatment of whooping-cough in all stages of the disease. The spray which he uses is made up as follows:

℞.—Carbolic acid . . . . . grs. vj.
Menthol, 4 per cent. solution . . . ℥iv.
Cocaine, 3 " " . . . . ℥iij.
Glycerin . . . . . ℥j.
Cherry-laurel water . . . q. s. ad ℥j.—M.

This solution should be thoroughly used, brutally if necessary, by an atomizer every three hours; force may be employed if necessary, and disre-

garding any apparent strangling upon the part of the little one during vigorous atomization, the nozzle of the instrument should be directed as far into the mouth of the patient as possible. During the struggling and sputtering and strangling some deep respirations will before long be made, and the object is accomplished. At first, in most cases, a violent paroxysm of coughing may result from the spraying, especially if much force has to be used with the child, but these soon cease and palpable effects are soon noticed by the parents. The point is to be able to impress the importance of perseverance. Dr. Schmid has seen whooping-cough arrested by this means after one thorough spraying, the cough continuing without the whoop for a while, and perfect recovery has followed in one or two weeks. From his success, he feels justified in claiming that the method promises to be more efficient than other means of treating the disease.—*Medical Record*, June 13, 1891.

Treatment of Constipation in Children by Abdominal Massage.

Karnitzky describes this method of treatment in both acute and chronic constipation in children from eight to twelve years of age. He concludes that abdominal massage may produce effects upon the alimentary tract, in connection with digestion, which are not inferior to those produced by purgatives. Habitual constipation may be easily cured by massage without the aid of purgatives, and the more readily the younger the child. The younger a child is the milder should the manipulations be and the shorter the séances, which should be from three to ten minutes, according to the age of the patient. Longer séances are inadvisable, and may even be harmful and aggravate the condition of the patient. Abdominal massage may be regarded as the best means of treating constipation in children. Purgatives should only be used in exceptional cases.—*Journal de Médecine*, 1891.

Aloin.

Professor Hans Meyer, of Marburg, has examined chemically and physiologically the aloïn obtained from various kinds of aloes. From the Barbadoes and Curaçoa he obtained the same crystalline substance. Natal aloes yielded a somewhat different aloïn. In experiments on animals and on man the aloïn was given per os and also subcutaneously. The aloïn can be detected in the feces and urine by tests which are given at length and which are extremely delicate. Experiments showed that aloïn acted with certainty as a purgative, whether given by the mouth or subcutaneously. The dose in both cases is about the same, which is explained by the fact that aloïn, when given hypodermically, is excreted from the blood chiefly into the bowel, only a mere trace, or none, being found in the urine. In man, dogs, and cats, there is no albuminuria after subcutaneous injection, but in rabbits—in which animals aloes does not cause purgation—subcutaneous administration is always followed by inflammation of the kidneys, albuminuria, and death. Its purgative action is as slow when it is given hypodermically as it is per os. Natal aloïn by subcutaneous injection is always active. In man on an ordinary mixed diet it had but little effect, but in man fed exexclusively upon an animal diet it was much more active. The reason prob-

ably is that in the latter case the putrefactive processes in the intestine are much more marked, and the aloïn is decomposed into a more active substance. All the experiments seem to point to the conclusion that aloïn itself is not an active purgative, but that it becomes gradually decomposed in the intestine into a more active body, and hence the slowness of its action.—*British Medical Journal*, 1891.

Diuretin as a Means of Removing Dropsy.

Dr. Robert H. Babcock has used diuretin with good results in three cases, and considers that in this remedy we have a useful drug. The alkaloids caffeine and theobromine are diuretics of great power, but the former has the drawback of primarily increasing arterial tension by its stimulation of the vasomotor centres. An objection to caffeine in large doses, say five to ten grains three or four times a day, lies in the nervousness and insomnia of which patients are apt to complain. Moreover, the system becomes speedily accustomed to its effect, necessitating the employment of increasing doses.

This remedy is readily soluble in warm water, and had better be administered thus or in pill form, since, if exposed to the air, as in powders, it undergoes a change. The daily dose is large—sixty to one hundred and twenty grains in twenty-four hours. It may be given in divided doses of fifteen grains each.

His conclusions are that diuretin is a diuretic of great power and promptitude, suitable to all forms of dropsy. Since it does not increase arterial tension, it is likely to succeed where digitalis, caffeine, and their congeners fail. In cases of cardiac dropsy with great feebleness of the pulse and erythema, it will strengthen and regulate, rather than depress, the heart's action.

It appears to cause no irritation of the stomach or kidneys, and requires to be given to the extent of from ninety to one hundred and twenty grains daily, and preferably in small doses frequently repeated.—*New York Medical Journal*, July 11, 1891.

Treatment of Chyluria by Thymol.

Two cases are reported, in which the filaria sanguinis was found, where complete cure followed the internal use of thymol. The first case was that of a man twenty years of age. The urine was white. Quinine and many other remedies were tried without any result; the urine remained milky and the patient's fever continued. Thymol was given every four hours in doses of five-sixths of a grain. Fifteen days later the dose was doubled. A month after this treatment the patient was cured and no more filariæ were found in the blood. The other patient was relieved under the same conditions after a month's treatment, taking the same dose three times a day.

These two cases suggest that the thymol destroys these organisms in the blood and in the tissues. The author has tried the effects of thymol upon other pathological organisms, such as the bacillus of tuberculosis and of leprosy, but without any result.—*Bulletin général de Thérapeutique*, 1891.

MEDICINE.

UNDER THE CHARGE OF

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MALTA (REMITTENT) FEVER.

GADDING (*British Medical Journal*, 1891, No. 1585) gives an analysis of forty-two cases occurring on H. M. S. Agamemnon.

The writer describes three types: Enteric type, always severe and generally supplying the fatal cases. Remittent type, with high initial temperature, marked remissions and tendency to relapses. Hybrid type, supplying 60 per cent of the cases. The primary attack is often trivial and of short duration. Rheumatism of an obstinate character is a common sequela and relapses of a severe nature are common. These cases are variously described as "Malta fever," "sweating fever," "typho-malarial," and "undefined climatic fever."

Etiology: The disease commences almost invariably in the spring. A few cases followed exposure to a hot sun. In four cases trifling injuries, bruises, and sprains appeared to determine the attack. Exciting causes: Malarial poison plays an important part, but true ague is not often seen. The disease is no doubt largely filth-produced, and improved drainage and water supply have lessened the virulence of type. The poison concentrates its force on the lymphoid structures of the alimentary canal (tonsils and Peyer's patches), thus accounting for the resemblance to typhoid fever; but the disease must not for this reason be assumed to be typhoid.

Duration: One week to six or seven months. Only eight made perfect recoveries, and were from one to six weeks under treatment. No eruption was noted in any case.

Symptoms and complications: Acute orchitis was noted in seven cases. Rheumatism occurred in nearly all at some period of the attack, and was often a troublesome sequela. Pneumonia was observed in three cases, the signs rapidly clearing in two. One death occurred from secondary pneumonia.

Diagnosis: The majority of cases point strongly to a malarial origin. The chief points of difference from true "remittent" are: (1) absence of splenic and hepatic enlargement; (2) powerlessness of quinine to cure, and (3) character of the complications—rheumatism, orchitis, tonsillitis, etc. The disease really defies all treatment. The one efficient remedy is change of climate.

In the opinion of SURGEON DAVID BRUCE, M.S., founded on an experience of 400 cases in the Military Hospital at Valetta, Malta fever is in no sense a

malarious fever; it is a species of fever perfectly distinct from enteric or malarious fever, having its own definite parasitic cause, and is as worthy of specific recognition as diphtheria or tuberculosis. The writer states that in every fatal case of true Malta fever a definite microörganism is demonstrable which has not the slightest resemblance to the amœba-like parasite of malaria. It can be cultivated with the greatest ease from the spleen and other organs, and has never been found in the organs of cases of malarious fever or any other disease. No description is given of the microörganism in question.

Double Empyema.

Handford, of Nottingham (*British Medical Journal*, 1891, No. 1585), reports the case of a boy, aged seven and a half years, in whom double empyema followed on an illness of three weeks' duration. The left chest was opened and three-quarters of an inch of rib removed. Dyspnœa was much relieved by the evacuation of pus. Ten days later the right chest was emptied in a similar way. Both tubes were left out at the end of nine weeks, and the patient made an excellent recovery.

Fibroid Pneumonia.

Auld, of Glasgow (*Lancet*, 1891, Nos. 3537 and 3538), under this title describes two cases of an affection of the lungs which "has only within recent years begun to be recognized." The affection is in no way connected with those variously known as chronic broncho-pneumonia, chronic pleurogenous pneumonia, pneumo-koniosis, and phthisis pulmonalis.

Anatomically, though not clinically, the disease is identical with chronic pneumonia succeeding acute pneumonia. It has also been termed "parenchymatous pneumonia," or "primary indurative pneumonia." Cases of this disorder have been described by Ludwig Bühl, in 1872, and M. Heitler, in 1884, and also by Eppinger, Wagner, and Talma. English medical literature contains a few isolated examples.

From the consideration of his two cases, together with the indications afforded by those quoted above, the author concludes—(1) that there is a pneumonia, a lobar affection of the lungs, insidious in its origin and subacute or chronic in its course, characterized essentially by induration of a creeping fibrinous exudation and by interstitial changes, and accompanied by proliferation and fatty degeneration of the pulmonary epithelium, and also not unusually of the bronchial epithelium; (2) that anatomically the disease is in every respect identical with chronic pneumonia succeeding an acute attack; and (3) that the morbid anatomy of the disease has in its earlier stages such distinctive and unequivocal features as to give the affection an assured position and to permanently exclude the possibility of confounding it with any other chronic affection of the lungs. Insomuch as this disease—whether preceded by an acute pneumonia, or being chronic from the first—has as its leading feature the development of a nuclear fibrous tissue in, with, and about a pneumonic exudation, it is most fitly termed "fibroid pneumonia."

The subacute cases usually terminate fatally in about six weeks, after run-

ning a course not unlike that of acute phthisis. Tubercle, when present, is limited. In one of the author's cases there was no tubercle, and the bronchial pus contained the capsulated diplococcus pneumoniæ. In the other case there was apical cicatrix and adhesion, with included cretaceous matter and general fibrosis of other organs.

In the writer's opinion it is chiefly, if not exclusively, after an acute onset that fibroid pneumonia may assume the chronic type. The subacute cases are distinguished from chronic broncho-pneumonia by their comparatively short duration; but there are admittedly great difficulties in the way of making a clinical diagnosis of this disease, among which may be mentioned its rarity and the similitude in general of its physical signs and symptoms to those of phthisis.

Points of Affinity between Rheumatoid Arthritis, Locomotor Ataxia, and Exophthalmic Goitre.

Spender (*British Medical Journal*, 1891, No. 1587) mentions that nearly every case of rheumatoid arthritis in early or middle life shows marks of cerebral sympathy in one or more ways: pigmentation, sweating, tachycardia or high tension, neuralgia. Pigmentation is common, and of various hues. A bronze smear across the forehead, dark streaks beneath the lower eyelids, or staining of the cheeks or neck are met with: discolorations which closely resemble those occurring in exophthalmic goitre. Leucadermia is met with in both diseases. Discoloration of the skin is, however, rarer in arthritis than in exophthalmic goitre.

Tachycardia is a not uncommon feature of early cases of arthritis. In nine out of eighteen cases of undoubted rheumatoid arthritis the average pulse-rate was above 90. The heart's action was not accelerated by emotion or moderate exercise. There were no murmurs. Venous hum was frequent. Attention is drawn to the occasional coincidence of thyroid enlargement in rheumatoid arthritis, especially where there is a dark stain on the neck.

Tremor and muscular spasm are common to both diseases, though far less frequent in arthritis.

Functional disturbance of the pneumogastric nerve is an important bond between arthritis and locomotor ataxia. Gastric crises, cramps of the stomach and vomiting, a pseudo-asthma, or a transient dyspnœa and difficulty of swallowing may occur in the early stages of both diseases. But the closest analogy between them is in the nature and character of the pain. The author inclines to the view that rheumatoidal and Charcot's joint lesions are identical.

Bradycardia, or the Slow Heart.

Seymour Taylor (*British Medical Journal*, 1891, No. 1589) says: Bradycardia is defined as being that condition in which the heart-beats do not exceed forty per minute. A classification of causes is difficult, owing to the wide pathology and varied associations; hence he proposes to subdivide the cases into two headings: *A*. Occurring in health; *B*. Occurring in disease. (*A*.) As regards health. It frequently occurred in tall, muscular men, who were or had been athletic in their habits. In them it was not inconsistent

with prolonged life and great mental vigor. It was important to note that in such examples the bradycardia was not attended with dyspnœa. It was not infrequently an accompaniment of old age, but an age which might be attended with no other sign of decay or degeneration. There was also a group of cases which, for want of a better term, might be called "functional." They were usually an accompaniment of indigestion, or some other disorder of stomach or other organ. They were temporary only, and were not attended with any signs of heart lesion. (*B.*) Cases the result of disease. Here the assertion that disease tended to quicken rather than to lessen the heart's action was admitted. Yet there were some disorders which produced an opposite effect. For example, it was occasionally seen in (1) disease of the heart-walls; (2) obstruction of coronary vessels; (3) as a sequel of certain fevers and blood diseases; (4) in relation with diseases of the respiratory beat and mechanism; (5) as a manifestation of grave neurotic changes—epilepsy, traumatism, etc.; (6) in abdominal injuries and operations; (7) as the result of certain drugs and poisons.

Senile Chorea; Mania; Recovery.

Ferrier (*Lancet*, 1891, No. 3538) records the case of a woman, aged seventy years, who had an attack of left-sided chorea in 1890. The present attack affected the right side and began at Christmas-time with a severe bilious attack, and was accompanied by great irritability of temper and sleepnessness.

On admission to hospital there was typical chorea of the right side. The thoracic and abdominal viscera were healthy. The same night the patient became acutely maniacal and had to be isolated and put into a straight waistcoat. She was taken home after three weeks in practically the same condition. About nine weeks later the chorea began to subside, and the condition of cerebral excitement rapidly passed off. The treatment consisted mainly in the administration of bromide of potassium, arsenic, and quinine.

On the Treatment of Intussusception by Injection or Inflation.

Mortimer (*Lancet*, 1891, No. 3534), while fully admitting certain obvious advantages, draws attention to some of the dangers of this plan of treatment. Inflation does not appear to be safer than injection. An even pressure should be employed in all cases to lessen the chance of exciting peristalsis and rupture. With a view to ascertain the limits of safety of the mode of treatment, post-mortem experiments were made on infants. It was found that when the resultant pressure distending the colon rose to two and a half pounds to the square inch (irrigator raised five feet) there was apt to be cracking of the peritoneum. In some cases there was complete rupture of the bowel at a slightly higher pressure (irrigator at six feet). The writer criticises adversely the conclusions of Dr. W. E. Forest, of New York, in regard to the amount of pressure which it is safe to use.

An interesting case is quoted in which post-mortem experiment was made on a case in which invagination had occurred during life. The subject was an infant aged three months, who presented the usual signs of acute intussusception. Inflation was performed with a Higginson's syringe and the tumor

gradually disappeared. The symptoms recurred after some hours and ended fatally. On examination the stomach and intestines were much distended; there was no peritonitis; the apex of the intussusception was below the splenic flexure. A tube was tied into the rectum and the irrigator raised to two feet. The intussusception was reduced in a few minutes with the exception of one inch; the end of the ileum, the cæcum, and part of the vermiform appendix remaining tightly ensheathed by the colon. After fifteen minutes the irrigator was raised to three feet. A slight further reduction took place, but in four minutes the colon ruptured in three places just below the intussusception.

In another case, in a child aged eight months, about ten ounces of water were injected three times from an irrigator held at three feet, and on the two following days a pint of water was run in at a lower pressure. Post-mortem, three ruptures were found in the descending colon. The writer argues against inflation or injection as a prelude to laparotomy.

Cerebral Suppuration following Influenza.

Dr. J. S. Bristowe (*British Medical Journal*, 1891, No. 1592) reports two cases in which the patients were attacked two to three months before death with symptoms indistinguishable from those of influenza.

In the first case, that of a carman, aged twenty-four years, cerebral symptoms came on early and continued with variations and ingravescence to the end. In the second, that of a school-girl, aged fourteen years, headache was an early symptom, but it was only latterly that the symptoms indicated the presence of grave cerebral disease.

The facts which lead the author to conclude that the cerebral abscesses in these cases were referable to influenza are: (1) Acute onset with symptoms indistinguishable from those of typical influenza; and (2) That none of the usual causes of abscess of the brain were or had been present.

In Case 1 the abscess—the size of a small Tangerine orange—was situated in the upper part of the left hemisphere. There was no disease of the ear nor any other condition tending to throw any light on the origin of the abscess. In Case 2 the abscess—which was about the same size—was situated in the right occipital lobe and adjoining part of the sphenoidal lobe. The ears and frontal sinuses were quite healthy.

In an addendum Dr. Bristowe mentions briefly three other cases in which influenza terminated fatally with symptoms of cerebral disease which may have been due to suppuration.

The Significance of Cheyne-Stokes Respiration as a Symptom in Cardiac Disease.

Dr. M. A. Boyd reports a case of cardiac hypertrophy and dilatation with systolic aortic bruit in which Cheyne-Stokes breathing occurred, presenting several features of interest.

The phases of the respiratory phenomena observed were as follows:

(1) An apnœal period characterized by deep sleep, lividity of face, quick pulse, feeble contractions of heart, perfect rest from all agitation, mental and bodily.

(2) An inspiratory period, with rousing of all the patient's faculties, extreme restlessness, slowing and strengthening of the pulse, apparently stronger contractions of the heart, less lividity of the face, and then a final deep inspiration.

(3) An expiratory period, with inspirations gradually getting shorter and expirations longer, pulse getting quicker and heart feebler in its contractions until expirations cease and the chest is empty, and restlessness gives place to sleep, which continues through the apnœa following.

The author lays stress on the variations in the pulse or cardiac rhythm during the different periods, and draws attention to the fact that though the respiratory effort during the ascending period is an inspiratory one, during the descending period of the effort it is chiefly expiratory. He is of opinion that the cardiac conditions necessary for the production of this form of breathing are not alone dilatation of the aorta, but also dilatation of the right ventricle with commencing degeneration or weakness of its walls; also hypertrophy of left ventricle with or without dilatation, but with degeneration of its muscle or enfeeblement from any cause, so that it is unable to empty its contents into a dilated and inelastic aorta.—*Dublin Journal of the Medical Sciences*, 1891, No. 235.

Influenza Epidemic of 1889–90.

In the official Report just published, Dr. Parsons, who undertook the inquiry, tracks the general course of the epidemic from the northern hemisphere in a direction east and west, and it is explained that this took place mainly against the prevailing winds.

The theory of its relation to some Chinese inundations and of an aërially travelling miasm across the Asiatic and European continents is not borne out by the information procured; but, on the other hand, there is an abundance of evidence to show that it travelled mainly along the lines of human intercourse, attacking large towns and centres of population first, and that the disease travelled only just as fast as any humanly conveyed infection with a similar incubation period might have been expected to travel.

On the question of infection Dr. Buchanan, in his introduction to the report, writes: "Probably no evidence has ever been put on record in such abundance as that accumulated in Dr. Parsons' report, to show that, in its epidemic form, influenza is an eminently infectious complaint, communicable in the ordinary personal relations of individuals with one another. It appears to me that there can henceforth be no doubt about the fact."

Dr. Parsons does not appear to be impressed with the evidence in favor of the existence of any direct relation between influenza and the disease in horses known as "pink-eye."

Over-crowding and impure air must be regarded as having a powerful influence in developing the epidemic, whilst poverty and absence of warm clothing have largely conduced to the fatality of the disease.

The contagium of the disease does not appear to be of a very stable kind, and one characteristic of its instability lies in its uncertain and varying incubation period. Speaking generally, the evidence adduced points to a period of two to three days as the most common period of incubation, and to twenty-

four hours on the one hand, and to some four days on the other, as fairly common extremes.

The poison may find admission into the system through the lungs, but Dr. Bezly Thorne, whose views are quoted at length in the report, is of opinion that the conjunctiva is the structure which the infecting material or microbe most generally, if not always, attacks.

The Practical Electro-therapeutics of Graves's Disease.

H. W. D. Cardew, M.R.C.S. (*Lancet*, 1891, No. 3540), is of opinion that many cases in which drugs have proved valueless are amenable to electrical treatment.

For this purpose galvanism is superior to faradism. A very weak current (two to three milliampères) is sufficient. Each application should last six minutes and frequent applications (three times a day) should be made. The anode should be placed on the nape of the neck, the centre of its lower border corresponding to the seventh cervical spinous process, and be firmly held in that position during the application. The kathode should be moved up and down the side of the neck from the mastoid process along the course of the great nerves. The application is followed by a reduction in the frequency and force of the heart-beat, prolongation of the diastole being most marked. The slowing of the pulse-rate does not usually last for more than half an hour. The diminution in violence of beat lasts longer. As the case progresses and improves these effects become permanent.

The Treatment of Tuberculosis by Means of Subcutaneous Injections of Eucalyptol, Guaiacol, and Iodoform.

Pignol (*Compt.-rend. hebdom. des Séances de la Soc. de Biol.*, 1891, No. 10) reports that for three years he has applied eucalyptol, alone or in combination with iodoform and creasote or guaiacol; guaiacol and iodoform, without eucalyptol; and creasol and guaiacol, subcutaneously, in the treatment of tuberculosis, with most satisfactory results. He uses as a menstruum sterilized liquid vaselin, olive oil, or oil of sweet almonds—preferably one of the latter two—containing twenty per cent. of the medicaments in varying proportions, of which at least from three to ten cubic centimetres are injected daily. The injections are made with antiseptic precautions into the retro-trochanteric fold. The best results were obtained from a combination of guaiacol and iodoform.

Picot (*Bull. de l'Acad. de Méd.*, 1891, No. 9) has reported the results of treatment in twenty-five cases of pulmonary tuberculosis and eight of pleurisy by means of subcutaneous injections of iodoform and guaiacol, dissolved in sterilized olive oil and vaselin, each cubic centimetre of the solution containing one centigramme of iodoform and five of guaiacol. The injections, each of three cubic centimetres, were made into the supra-spinous fossa daily, and were unattended with unpleasant local results. As an evidence of the absorption of the medicaments, the presence of iodoform could be demonstrated in the urine, guaiacol not being eliminated by the kidneys. As a rule, the

injections occasioned no general reaction, but in certain cases, especially in those with fever, profuse perspiration followed, succeeded in turn by a sense of comfort and a lowering of temperature. In exceptional instances abdominal pain and diarrhœa developed in the course of treatment, but subsided on suspending the injections. In three cases of advanced phthisis, in which death took place, the changes found in the lungs were indicative of a reparative tendency. The tubercles presented an appearance of beginning fatty degeneration; the cavities were clean and dry. In one case the ulcers in the intestine showed a disposition to cicatrization. Neither in the lungs nor elsewhere was there any evidence of a fresh eruption of tubercles as a result of the treatment. In the remaining cases of phthisis the cough diminished, the sputum became less, and the number of bacilli in the sputum smaller, the body weight increased, the night-sweats disappeared, the general condition improved, and the physical signs receded. In the cases of pleurisy the results were equally good. Effusion speedily disappeared, and recovery was rapid.

Diabetes and Vascular Sclerosis of the Pancreas.

Lemoinne and Lannois (*Arch. de Méd. expérim. et d'Anat. pathol.*, 1891, No. 1) made a study of the pancreas in four cases of diabetes: three of these belonged clinically to the so-called pancreatic type; one was in a case of long standing. In the last, the liver and kidneys presented alterations similar to those found in the pancreas. In the other three the liver contained several limited areas of interlobular sclerosis not involving the hepatic lobules; the kidneys presented no lesion; the pancreas, however, presented marked changes. In all, the lesions of the pancreas were topographically the same. Sections of pancreatic tissue, hardened in Müller's fluid and stained with hæmatoxylon or carmine, exhibited interacinous and intercellular sclerosis—a true interstitial pancreatitis—having for its point of departure the vascular system and notably the venous and lymphatic system of the gland, and giving rise to consecutive degeneration of the cellular elements. This differs from the conditions found after ligature of the duct of Wirsung, in that the dilatation of the duct is followed by its fibrous transformation, the vascular sclerosis appearing late and as an accessory phenomenon. In the cases in which the pancreatic duct has been ligated the absence of sugar in the urine has been expressly noted. These facts give support to the opinion of M. Lepine that the pancreas, like the liver, has a double function. The liver elaborates not only bile, but also glycogen; the pancreas separates not only trypsin, amylopsin, and steapsin, but also a glycolytic ferment—the first three at the free extremity of the cell, the last at that pole of the cell in relation to the vascular supply.

Hemiatrophy of the Tongue of Peripheral Origin.

Before the Canadian Medical Association, at Toronto, Birkett (*Montreal Medical Journal*, 1891, No. 9) reported a case of hemiatrophy of the tongue of peripheral origin. The patient, a bank clerk of twenty-three, nine years

previously, following an attack of mumps, noticed a large and painful swelling behind the angle of the jaw on the right side. Subsequently there was some difficulty in speech, and the tongue, when protruded, deviated to the right. Five years later it was observed that pressure upon the swelling led to flushing and sweating on the right half of the face and to a sense of dryness of the throat. At the time the patient came under observation, when the mouth was opened, the tip of the tongue pointed to the left, but when the organ was protruded, the tip deviated to the right. The right half of the tongue was smaller than the left, and presented reactions of degeneration, but there was no fibrillary contraction, and the sense of taste was unimpaired. There was paresis of the right half of the soft palate, and the mucous membrane of the fauces, soft palate, and walls of the pharynx were insensible to titillation. Sensation, however, was unimpaired at the posterior extremities of the inferior and middle turbinated bones and on the lips and mucous membrane of the mouth. The right vocal band occupied the cadaveric position, scarcely moving in abduction and adduction. Movement of the right half of the epiglottis was defective. The pulse was ninety-six in the minute. The pupil was smaller and the palpebral fissure narrower on the right than on the left. Vision was myopic—on the right by 1 D.; on the left by 0.25 D. From a careful study of the case Birkett believes the lesion to be peripheral, the result of inflammatory changes in and about a cervical gland behind the angle of the jaw and involving the hypoglossal, the vagus, and the accessory nerves, the pharyngeal plexus, and the superior ganglion of the cervical sympathetic—all on the right side. The following deductions are made:

1. The hypoglossal is the motor and trophic nerve of the tongue; 2, the glosso-pharyngeal nerve is concerned in the function of taste; 3, branches of the pharyngeal plexus supply the mucous membrane of the naso- and buccal pharynx with sensory fibres; 4, the motor nerve of the levator palati and azygos uvulæ muscles is probably the accessorius; 5, the superior ganglion of the cervical sympathetic contains (*a*) dilator fibres to the iris of the same side; (*b*) vasomotor fibres; (*c*) sweat fibres; and (*d*) secretory fibres to the mucous glands of the pharynx.

Pulmonary Abscess.

In a paper read before the St. Louis Medical Society, Porter (*Journal of the Amer. Med. Association*, 1891, No. 10) expressed the view that pulmonary gangrene or abscess following embolism is not necessarily multiple; that gangrene may follow embolism of a pulmonary artery; and abscess, embolism of a bronchial artery. When the products of disorganization can be readily discharged, with the probability of cicatrization taking place, operation may be deferred; but when there are evidences of rapid breaking down, when fever, restlessness, and depression are marked, prompt and active measures are indicated. When the abscess is extensive and operation necessary, Porter prefers to excise a large piece of rib over the cavity and make a free opening in the pleural sac. A smaller incision may be made in the lung. Two cases of gangrene, successfully operated upon in the manner indicated, are reported.

Morvan's Disease.

Church (*Journal of the Amer. Med. Association*, 1891, No. 10) reports a case of so-called Morvan's disease, with a brief review of what is known on the subject, the literature of which is scanty. The affection is characterized by a destructive process, progressively and symmetrically involving the digits, ulceration with exfoliation of bone taking place, and resulting in deformity, sometimes preceded by pain and attended with anæsthesia. In the only case of the disease in which an autopsy has been reported, an excess of connective tissue was found in the posterior horns, posterior columns, and gray matter of the cervical cord and in the peripheral nerves. Nothing is known as to its etiology. The disease is to be distinguished from scleroderma, anæsthetic lepra, symmetrical gangrene, and syringomyelia. The treatment is symptomatic.

Congenital Occlusion of the Œsophagus; Communication between the Trachea and Œsophagus.

Grandou (*Bull. de la Soc. Anat. de Paris*, 1891, No. 3) reports the case of a newborn infant, which, applied to the breast several hours after birth, took the nipple without difficulty. Each time it nursed, however, the infant became congested and purple; it then abandoned the breast, and almost immediately vomited the milk it had taken. Efforts at feeding with a spoon and gavage were no more successful. Death took place on the sixth day. On examination the superior portion of the œsophagus was found to be normal; lower down was a dilatation an inch and a half in length, below which the œsophagus was replaced by a firm cord, two-thirds of an inch long and a quarter of an inch thick, adherent in front to the trachea. Beyond this the œsophagus resumed its calibre for a distance of a little more than two inches, at its termination emptying into the stomach. Opening the trachea from in front an orifice with bevelled edges, the plane of which looked upward and forward, was found on the posterior wall, a little more than an inch below the cricoid cartilage. This orifice communicated with the lower portion of the œsophagus and through it the mucous membrane of the trachea was continued.

Partial Nephritis.

Cuffer and Gastou (*Revue de Médecine*, 1891) describe as partial nephritis a condition succeeding the acute or active manifestations of a renal lesion, in which a fixed and invariable amount of albumin is present in the urine, although the patient is in all other respects in perfect health. Five cases illustrative of the condition are cited. Pathological evidence is wanting, but an analogy is made with the lesions found in amyloid disease, in arterio-sclerosis, and in plumbism, in which diseased and healthy structure alternate or the disease is less decided at one part than at another. The condition must be considered not as a disease, but as an infirmity, for which treatment is useless and may prove hurtful. It is important, however, for the patient to avoid those influences which are known to affect the kidneys injuriously.

The prognosis is not grave if appropriate precautions are taken. The conclusions formulated are that persistent albuminuria is a result of a past nephritis, in the chronic stage, and that the persistence of a fixed amount of albumin in the urine, incapable of diminution, is evidence of a partial nephritis.

SURGERY.

UNDER THE CHARGE OF

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STAB-WOUNDS OF THE SPINAL CORD.

DR. OTTO BODE (*Berliner klinische Wochenschrift*, Jahrg. xxviii., No. 22) gives an interesting account of the diagnosis, course, and proper treatment of stab-wounds of the spinal cord. He cites the case of a man who, in a street fight, received several wounds on the head; on the back of the neck there was one about five centimetres long, running obliquely down to the spinal column and exposing at its bottom the atlas and axis. At the moment of wounding the patient fell to the ground, lost consciousness for only a minute, but remained paralyzed on the right side below the point of wounding. When called upon the right lower extremity responded slowly and reluctantly, but for walking or standing was weak and useless. There were no areas of anæsthesia, nor any disturbance of the special senses. The bladder and rectum were normal; priapism not present. The muscles of respiration on the right side were decidedly implicated. The faradic excitability of the muscles remained normal. For three weeks this condition continued apparently unaltered. At the expiration of this time the patient began to gain more and more use of the paralyzed limbs, albeit at the same time the reflexes became greatly exaggerated, and at the least touch the muscles jerked. The patient was under observation for three months; the paralysis was practically gone, and even the reflexes had returned to normal, and in a year's time no evil effects of the wound remained, save at times a slight tremor in the muscles which had been paralyzed. The wound was treated solely by the antiseptic dressings.

From the anatomical relations of the vertebræ and their ligaments, Dr. Bode proceeds to show that in the cervical region when the neck is bent down, as it usually is when a man receives a wound there in a fight, the cord can be wounded at almost any point of its circumference, or, indeed, may be wholly severed, without injury to the vertebræ. From the motor

disturbances and the direction of the external wound in his case, he diagnoses a partial severance of the anterior column and the anterior part of the lateral column on the right side. Therefore, he maintains that it is not possible that the lateral columns in the cervical cord carry both sensory and motor fibres, since in his case there were absolutely no disturbances of sensation.

Dr. Bode cites several cases of perfect healing of wounds of the spinal cord involving not quite half its diameter, which were recognized during life to be wounds of the cord, or were subsequently clearly demonstrated at the autopsy by the cicatrices.

He goes on to explain that the appearance of symptoms which set in generally on the second to the third day after the wounding, and which might easily be mistaken for traumatic myelitis, is due to what Schiefferdecker describes ("Ueber Regeneration, Degeneration, und Architektur des Rückenmarks," *Virchow's Archiv*, Bd. lxii.) as traumatic degeneration following wounds of the spinal cord, and setting in on the second to the third day. The degeneration begins as a disintegration of the elements of the nerves into glossy flakes. This process extends from the cut surfaces about four to six millimetres above and below. Hence, in the case of wounds in the neighborhood of the fourth cervical vertebra, although the phrenic nerve be not at first implicated, yet at the end of the second or third day that complication may arise.

The increase of the reflex excitability, Dr. Bode explains as due to what Schiefferdecker describes as secondary degeneration, which manifests itself about the fourteenth day, and which, by cutting off the influence of the reflex inhibitory fibres running down the lateral columns in the cervical cord, gives rise to an increase in the reflexes. Schiefferdecker describes a third form of degeneration, which he calls cavity formation, and to this Dr. Bode ascribes the fibrillary tremors in the limbs formerly paralyzed.

Retention of urine and feces is not uncommon following wounds in this region. The organs either return to normal, or else incontinence sets in. The height of the wound has no influence hereon. Priapism almost always occurs where there is vasomotor disturbance. Elevations of temperature are not found on the anæsthetic areas of the skin, if there be any, but only on the areas where there is motor paralysis. This proves that the vascular nerve-supply runs down the same paths as the motor fibres. Dr. Bode cites a very interesting case where he found variations of temperature of the affected part entirely independent of the temperature variations in the rest of the body.

He maintains that it is impossible to locate with absolute certainty the position of the wound on the cord from the symptoms, since some hemorrhage affecting the parts immediately adjoining is inevitable, and, furthermore, unless the assailant's knife be very sharp, it must make more or less of a contusion on the cord before it cuts through the elastic pia mater.

To sum up, the most conclusive symptom is a sharply defined paralysis below the point of wounding, coming on at the moment the wound is received.

As to treatment, he says the external wound should be enlarged and left open. Above all, free drainage should be encouraged, even to the loss of

meningeal fluid, and the blood and secretions of the wound should be kept aseptic. Finally, the wound should be allowed to heal by granulations, or sewn up secondarily.

Intestinal Anastomosis by Means of Vegetable Plates.

After reviewing the well-known objections to all the mechanical arrangements designed to accomplish intestinal anastomoses, Darbon (*Medical Record*, vol. xxxix. No. 26) states that he has discovered what may be called an entirely serviceable emergency plate in one made from a raw potato. He has experimented on a large number of dogs, and so far as this work goes has evidently well proven not only the reliability of his plates, but the value of certain modifications he has made in the operation of intestinal anastomosis. A pair of the potato plates can be made by his method in ten minutes. The material can always be procured. It has no tendency to swell; it is rigid, and remains so longer than the majority of other materials devised for this purpose. For use upon the human gut the plate should be made about one-third of an inch in thickness, and should be cut so long that the opening is about twice the normal diameter of the gut to be operated upon. To prevent the threads from cutting through they should be very coarse, and the needle before passing through the plate should traverse a scrap of rubber drainage-tube or a minute bit of cloth, which, by its broad surface, prevents the large knot tied on the end of the thread from pulling through. Instead of first making the incisions into the gut, which subsequently serve as the artificial opening, the plate is inserted into the lumen of the bowel through its divided end and the needles are made to traverse the gut-wall at their proper positions. When the two plates are thus placed in the two extremities of the bowel, at least two inches from the cut extremity, the corresponding threads of the two plates are tied together, thus apposing the two peritoneal surfaces covering the plates. These surfaces previously should be well scraped with a knife, so that prompt adhesions may take place. After the plate-threads are tied, at least one line of sutures should be run around the plates, great care being taken not to pass the needle into the lumen of the bowel. The author prefers a basting-stitch, since it is easier to apply, employing three stitches to the inch. When these stitches are placed, into one open gut-end a strip of wood is passed; this is for the purpose of cutting against; the opening is then made through the apposed gut-walls enclosed by the rings. To do this a scalpel is inserted into the open end of the gut, and as long an anastomotic opening is made as the plates will allow. The strip of wood prevents cutting too deeply. After this incision is made, water should run freely into one end and out of the other. Under gentle hydrostatic pressure, closing the outlet end with the finger and thumb for a few moments, the line of suture should not leak if properly made. The free ends of the bowel are next scraped, inverted, and secured in this position by a double line of running sutures.

Finally, a stitch or two is taken between the blind ends and the gut against which each rests, first scraping the peritoneal surfaces which are apposed. This prevents the possibility of another loop forcing its way into this angle with the result of undue tension of the stitches at the plate-ends. The author

states that he has without extreme haste done lateral anastomosis by this method, including tying off the mesentery and excising several inches of the gut, in half an hour, counting from the first incision into the belly-wall to the knotting of the last parietal suture. He claims as original: the material from which he makes his plates; his method of inserting the plates and making the anastomotic opening; his method of suturing; his method of denuding the peritoneum by means of the knife-blade, and his method of protecting the suture at the plate-ends by causing adhesion of the blind ends of the adjacent bowel. To those who have had much experience in laboratory work, the technique described would in some points commend itself.

Union of the Divided Ulnar Nerve by Plastic Operation.

Dittel (*Wiener klin. Wochenschr.*, Jahr. iv., No. 18) reports a successful plastic operation upon the ulnar nerve, although there was considerable loss in the continuity of this structure. The patient received a severe wound of the arm, which, together with extensive injury to the skin and muscles, destroyed about two and a half inches of the ulnar nerve. The peripheral end of this nerve could not be found. The wound was closed under antiseptic precautions. Examination on the following day showed that the sensibility of the skin supplied by the ulnar nerve was practically unimpaired, and that there was very slight difference in the muscular power of the right and left arm. This was evidently due to nervous anastomosis. Four weeks later an electrical examination showed that the muscles supplied by the ulnar nerve were completely paralyzed. By no form of current could contraction be induced. An operation for the restoration of the continuity of the nerve-trunk was at once undertaken, since it seemed desirable to accomplish this before marked degenerative changes could set in. By careful dissection the proximal and peripheral ends of the nerve were exposed. About three inches from the extremity of the peripheral nerve-end a thin-bladed scalpel was thrust directly through the centre of its trunk; by carrying the blade upward the trunk was split in two equal halves. The incision stopped short before reaching the extremity of the nerve. In a similar manner the proximal end was split. By transverse cuts half the nerve was freed and carried upward from the distal end, downward from the proximal end, until the extremities of the ends thus split off were brought in contact. Sutures were applied. To cover the large defect of the soft parts resulting from the original injury, a flap of skin was transplanted from the upper portion of the arm. Suppuration set in. The wound was dressed by the open method. Eight weeks after operation an electrical examination was made as to the condition of the muscles supplied by the ulnar nerve. The results were negative. Two weeks after this, however, the muscles reacted to electricity. At the time of reporting the case contractions could be excited, not only by application of the current to the muscles, but also by excitation of the nerve-trunk.

Brenner (*Ibid.*) also reports a successful neuroplastic operation ten years after injury to a nerve.

The patient exhibited a bluish discoloration and decided emaciation of the left index and middle fingers, the nails of which were thickened and turtle-backed. Both fingers were flexed at the metacarpo-phalangeal articula-

tions; tendons and joints were found to be normal on manipulation. The palmar surface of both these fingers and the ulnar surface of the thumb were completely anæsthetic; the other portions of the skin of the hand were normal. Ten years before, the patient had received a stab-wound on the flexor surface of the wrist-joint. The scar of this wound lay directly over the course of the median nerve; beneath it there was a hard knot the size of a cherry; this often occasioned great pain. It was diagnosed as a neuroma, and excision was determined upon. On dissecting this tumor free, it was found attached to the extremity of the central portion of the median nerve. On dividing this connection, the cross-section of the nerve seemed perfectly healthy. It was then determined to find the distal end of the nerve and restore the continuity of this structure by a plastic operation. The two extremities of the nerves were split almost to their terminations. The halves of the split trunk were freed at the points most distant from the terminations of the nerve; the flaps thus formed, made long enough to completely bridge the gap existing between the nerve-ends, were turned down and up, respectively, and were sutured to each other and to the freshened extremity of the two nerve terminations. The wound was closed, and healed by primary intention. Two weeks after operation there was return of sensibility. A year later sensibility was completely normal, and the contracture of the fingers was no more observable. The trophic disturbances, however, did not disappear.

Erosive Balano-posthitis.

An erosive circinate form of balano-posthitis, quite different from the ordinary type of the disease so often observed complicating gonorrhœa, is described by Berdal and Batailles (*La Médecine Moderne*, an. ii. No. 22). They find that there is a distinct inflammation of the epithelial covering of the foreskin and glans penis, characterized by the facts that it is inoculable and contagious; that it is not secondary to irritation, but is essentially primary and due to a microbe; that it has a definite course, starting in one or more erosions and extending centrifugally in circinate lesions; that these lesions are circumscribed by white, friable borders; that there is a very free purulent secretion in which spirilla can be found, and that this inflammation occasions lymphadenitis and polyadenitis. These are all characteristics sufficiently distinct from the salient features of ordinary balano-posthitis, which is neither inoculable nor contagious, is always secondary to mechanical or chemical irritation, has no definite course, begins not as an erosion, but as an area of acute hyperæmia, has little tendency to spread, and rarely produces extensive lesions.

Certain cases of herpes at times closely simulate the erosive circinate form of balano-posthitis; but in herpes the white, friable margin is wanting to the lesions, and, as Leloir has shown, on pressing an herpetic erosion between the fingers there is a free exudation of serum. This is not the case in circinate balano-posthitis. Mucous patches may so closely simulate the form of balano-posthitis described as to render a differential diagnosis impossible until sufficient time has elapsed to determine the nature of the disease from its clinical course.

There is also a certain rare form of chancre which produces lesions very like the circinate erosive balano-posthitis: this is the epithelial phagadenic chancre, manifesting itself in the form of an erosion which may extend over the greater part of the glans penis.

The treatment of erosive circinate balanitis consists in destroying the epithelial cells—the breeding-ground of the parasites which occasion the disease. This is best accomplished by nitrate of silver, bichloride of mercury, or strong solutions of carbolic acid. Other antiseptics are of little value.

Dupuytren's Contraction.

In a series of lectures delivered upon the contraction of the fingers and toes, Anderson (*The Lancet*, 1891, vol. ii. No. 2), after a careful study of the pathology and treatment of true and false Dupuytren's contraction, arrives at the following conclusions:

There are two forms of disease comprised under the name of "contraction of the palmar fascia," the one traumatic in origin, dependent upon changes in the integumental and fascial structures, and occurring at all ages; the other unassociated with obvious traumatism, tending to multiplicity of lesion, and almost confined to middle or advanced life.

The latter condition, true "Dupuytren's contraction," is not, strictly speaking, a contraction of the palmar fascia, but consists of a chronic inflammatory hyperplasia, commencing in the subcutaneous connective tissue and involving secondarily the palmar fasciæ and the deep fibres of the corium. The morbid bands are, for the most part, formed at the expense of the normal tissues.

This condition does not appear to be connected primarily with pressure or friction of the palm by tools or other objects employed in manual occupations, but is probably due to a specific infective agent which effects its entrance through epidermic lesions made by the finger-nails, or otherwise.

It is almost essentially a disease of advanced and middle age, more common in men than in women, occurring in all classes, tending to progress slowly through a long course of years, and to return after operation.

It is connected with a special diathesis, inherited or acquired, which cannot yet be expressed in any known terms; but neither gout, rheumatism, rheumatoid arthritis, nor any other of the ordinary constitutional ailments has been shown to have any causative relation to the disease.

It appears to be almost, if not quite, unknown in certain parts of the East, as in India and Japan.

The Microörganisms of the Normal Urethra.

Since Lustgarten and Mannaberg stated that in the healthy urethra of man were constantly to be found microörganisms which in form, grouping, and color reaction closely resemble gonococci, much discredit has been thrown upon the reliability of this latter microbe as an indicator of the presence of true gonorrhœa in any given urethritis.

Petit and Wassermann (*Annales des Maladies des Organes Genito-urinaires*, 1891, Tome ix. No. 6), in a series of carefully conducted researches, both microscopic and bacteriological, failed to find in any case the microörganisms

characterized by Lustgarten as pseudo-gonococci. They found a number of bacilli, micrococci, and sarcinæ, which they believe are saprophytes—that is, are accidental hosts, and which vary in accordance with the nature of the soil in which they grow. In 1000 examinations they failed to find pseudo-gonococci. Frequently, however, they observed sarcinæ, which on superficial examination might well be taken for gonococci. These, however, are not decolorized by Gram's method; there are also certain sarcinæ which are readily decolorized by Gram's method, but they are so much larger than the gonococci that they cannot readily be confounded with the latter.

Steinschneider has long since shown that it is not alone upon one feature that the gonococcus is to be recognized, but upon the facts that these organisms are grouped around nuclei in the interior cells, are decolorized by Gram's method as formulated by Roux, and are recolorized by Bismarck brown or by Loeffler's blue.

In summing up the results of their experimental investigation, the authors state that the normal urethra is always inhabited by various organisms; that the same varieties are not found in different urethræ; that different varieties are found in the meatus and in deeper parts of the canal; that none of the varieties found in the healthy urethra are pathogenic, and that the greater number of microörganisms of the normal urethra decompose urea.

OPHTHALMOLOGY.

UNDER THE CHARGE OF

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An Experimental Study of the Influence of the Retinal and Choroidal Circulation on the Nutrition of the Eye, particularly that of the Retina, and of the Consequences of Section of the Optic Nerve.

Under the above title Dr. Wagenmann contributes a long paper which occupies 120 pages of the last number of the *Archiv für Ophthalmologie*, xxxvi. H. 4. The investigation was undertaken at the instigation of Prof. Leber.

The experiments, which were made on rabbits, gave the following results:

1. Section of the optic nerve above the entrance of the central artery produced at first practically no alteration in the ophthalmoscopic image. Afterward a pallor of the disc became visible, and in the course of some weeks atrophy of the nerve bundles. After this lesion the circulation in the retina remains unchanged, but the retina shows a slight grayish veiling owing to

loss of transparency. The degeneration and disappearance of the nerve fibres can be followed anatomically. The degeneration spreads to the ganglion cells, but so slowly that well-preserved cells are to be found even after six months.

2. Section of the optic nerve with its vessels produces an immediate pallor of the papilla, a narrowing of the vessels, and disappearance of their blood-column. Generally, after the lapse of a week or two, there is an imperfect restitution of the circulation in the retina. This is effected by means of newly formed vessels springing from the choroidal ring, from the nerve-sheath, and from the episcleral ciliary vessels. The section of the retinal vessels is not followed by any opacity of the retina. The subsequent changes in the nerve are in no way distinguishable from those which take place after section of the trunk above the point of entrance of the central vessels.

3. Section of the long and short posterior ciliary arteries on the one side produces a rapid degeneration of all the corresponding layers of the retina. This shows itself at first ophthalmoscopically, and a few hours after the lesion, as a grayish retinal opacity. The nerve fibres above are relatively but little involved. Owing to the reëstablishment in a few days of the choroidal circulation a complete degeneration of the one side does not take place. Thus, on microscopic examination, the most varying degrees of degeneration are found in close proximity to each other. The outer layers suffer most severely. A subsequent migration of pigment takes place into the degenerated portion of the retina.

4. Section of the optic nerve and its vessels, and at the same time of the ciliary vessels of one side, leads to a rapid degeneration of the nerve-layer of the retina on that side, the same layer on the other side only atrophying slowly.

5. Section of the optic nerve and vessels and all of the ciliary vessels causes a rapid degeneration of the whole eye.

The author admits that one cannot unreservedly apply the inferences as to the sources of the nutrition of the retina to which these experiments on rabbits must lead, to the case of man. He points out in particular that whilst the division of the retinal vessels alone did not cause any opacity of the rabbit's retina, the sudden removal of the blood supply caused by embolism of the central artery in man is invariably accompanied by a marked opacity. There is this difference, however, that the veins are not blocked in the latter case, and although no case of fresh embolism has as yet formed the subject of microscopical examination, it is highly probable that the opacity met with is merely an œdema. In other respects, viz., in recovery of transparency by the retina and in the absence of any subsequent pigmentation, the condition of embolism in man is in accord with the experimental result on section of the vessels in the rabbit. Anatomically, too, it has been found that as the result of embolism the nerve-fibres and ganglion-cells slowly disappear.

On the Cortical Visual Centre in Monkeys.

Mazza has studied this question in the Physiological Laboratory at Genoa (*Annali di Ottalmologia*, xix. 6). He was struck by the fact that no previous experimenters had taken proper precautions to examine the field of vision.

After several attempts he succeeded in devising a plan which forced the animal to make use of direct fixation. This consisted in fixing a shell in the shape of an artificial eye, but perforated by a central aperture in the conjunctival sac in front of the eye. These shells were modelled from wax and caoutchouc. With such a shield, which had only a limited movement, in front of the eye, if the animal saw anything out of the direct line of vision one could feel sure that it did so with a peripheral portion of the retina. The experiments were made with a regular perimeter, the animal being fixed by means of a specially constructed apparatus. Removal of the cortex cerebri of the angular gyrus only produced a temporary concentric restriction of both fields of vision. Removal of the cortex of the occipital lobe produced a persistent hemianopia.

On the Validity of Weber's Law in the Case of the Light-sense.

Dr. Schirmer, by modifying the details of the usual method of testing the light-sense, has been able to show that Weber's law holds good with reference to this as well as to other senses. The light-sense referred to is what is now generally called the light-difference perception, or L. D.—*i. e.*, the extent of the power of distinguishing luminous impressions of different intensities. The statement of Weber's law is that "appreciation of the difference of two similar excitations of different magnitudes is not dependent upon their actual but upon their proportional differences." Former experimenters, and notably Aubert and Helmholtz, have denied the validity of this law in the case of the light-sense. Schirmer points out that the discrepancies between the results of these experiments and Weber's law are due to their not having taken into consideration the necessity for allowing for the adaptation of the eye for different light intensities. His own experiments, after providing for adaptation and performed with an ingenious modification of Masson's disc, led to the following results:

1. Weber's law is valid for the light-sense within a range of illumination of from one to one thousand standard candles at the distance of a metre from the illuminated surface. The eye must be allowed its full power of adaptation: so that the validity of the law is subject to the fulfilment of certain physiological conditions.

2. Physiological adaptation alone is capable of explaining why Weber's law should hold good, but Schirmer's experiments do not exclude the possibility of the participation of a certain psycho-physical process (such as Fechner assumed) in bringing about the result.

3. The adaptation of the normal eye does not all along keep pace with the diminution of daylight as dusk comes on.

An Experimental Study of the Nutrition of the Crystalline Lens and the Development of Cataract.

By examining the first stages in the development of artificial cataract in the lenses of living rabbits, by the method of magnification with a strong glass lens behind the ophthalmoscope mirror, Magnus (*Archiv f. Ophthalmologie*, xxxvi. 4) has been able to throw some light on the process by which

the crystalline lens is nourished, and to make some valuable suggestions regarding the etiology of idiopathic cataract.

The artificial forms of cataract studied were those produced by the internal administration of naphthalin, sugar, and salt.

One dose of three to four grammes per kilometre of body weight given to not too young a rabbit is sufficient to give rise to changes in the lens after six hours. According as it was desired to produce a greater or less degree of opacity this was repeated more or less often. The lenticular changes made their appearance always before any visible changes occurred in the fundus. Although both lenses usually show the changes about the same time, they are occasionally to be found well marked in the one while the other remains perfectly normal. Two distinct phases are to be distinguished in these changes.

In the first there are to be seen a number of transparent bands, in the second well-marked and progressive opacities. They both begin at the equator of the lens, and apparently the very first traces are met with in two zones, the one lying immediately behind and the other immediately in front of the equator.

A characteristic feature of naphthalin cataract is that the opacities are capable of clearing up, and do so invariably if the naphthalin be stopped after only two doses have been given. Even a well-marked opacity of this nature occupying the whole extent of the superficial layers of the posterior cortex may entirely clear away. The clearing up always takes place in exactly the same manner, proceeding from the equator and posterior pole.

As the recovery of transparency can only well be supposed to be due to the return to its normal condition of the nutrient fluid of the lens, the nature of the clearing process affords, Magnus argues, important conclusions as to the places of entrance of these fluids into the lens. It is thus rendered very probable that the position of the posterior zone of opacity and the posterior pole are important in this respect.

Further experiments with salt and sugar led to precisely similar conclusions. Altogether, the experiments led to the following results with regard to the conditions of nutrient supply in the case of the normal lens:

1. The nutrition processes are effected more actively and more completely in the posterior section than in the anterior section of the lens.

2. A zone lying posterior to, and parallel with, the equator appears to be that through which the most extensive supply of nutriment passes.

3. A zone anterior to, and parallel with, the equator appears also to be active in this respect, though less so than the posterior zone.

4. The posterior pole of the lens also transmits a current of nutriment, though to a less extent than either the anterior or posterior or equatorial zones.

5. No current appears to pass at the anterior pole.

6. The equator is dependent for its nutriment on the currents passing by the zones in front and behind it, but does not itself give entrance to any current.

Magnus's experiments do not give any indication as to the parts at which the nutrient fluid leaves the lens.

With reference to the very interesting question as to how far such experiments throw light on the development of idiopathic cataract, Magnus in the

first place draws attention to the fact that in the great majority of cases (in 92.77 per cent. according to a previous investigation of his) senile cataract begins exactly in the same manner as the artificial cataract. This points to senile cataract being essentially a disturbance in the nutrient current, showing itself first at the places where the current enters the lens. While, however, in experimental artificial cataract, the opacity is the result of an altered chemical constitution of the nutrient fluid, this cannot well be assumed in the case of senile cataract. It is more likely that the disturbance is more of a circulatory nature, and probably, too, this is the consequence of the senile sclerosis which takes place in the lens fibres. Further, no doubt there is a diminished power of resistance in the lens fibres of old people which favors the opacity which a stasis in the lymph-current tends to give rise to. In diabetic cataract, of course, it is natural to suppose that the opacity is more directly caused by the altered chemical constitution of the nutrient fluid.

OBSTETRICS.

UNDER THE CHARGE OF

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The Porro Operation, with Invagination of the Stump.

Frank's method of performing the Porro operation has been adopted by Beaucamp, who describes five cases so treated (*Archiv für Gynäkologie*, Band xl. Heft 1). Three of the operations were done for contracted rhachitic pelves, with a history of previous confinements with death of the fœtus. Mothers and children recovered.

One case ended fatally from hemorrhage between the membranes and uterine wall. The fifth case was that of a woman, brought to the hospital in a dying condition with ruptured uterus; the operation consisted of the total extirpation of the uterus after it had been inverted through the vagina. A fatal result followed, but the post-mortem showed the operation to have been successful so far as union was concerned.

Beaucamp describes his method as follows: Patients with contracted pelves are examined in the middle of pregnancy, and the chances afforded by induced labor and the Cæsarean and Porro operations are explained to them, the chances of the two latter being given as equally favorable. Labor is induced at the end of the thirty-third week. If the Porro operation is to be done, the patient enters the hospital in the thirty-ninth week, and is suitably prepared. The operation consists in opening the abdomen and the uterus, and removing the fœtus. The uterus is then inverted, and its attachments to the vagina are sutured. The abdomen is then closed, and the uterus and

tubes and ovaries are removed, and the pelvic peritoneum carefully sutured. Simplicity, speed, and safety are claimed for this procedure.

If the elastic ligature is employed, and the uterus resected at the cervix, the pelvic peritoneum is stitched about the stump, which is pushed up into the pelvis and a tampon of iodoform gauze is placed against it. The after-treatment consists in antisepticizing the vagina.

Forceps to the After-coming Head.

A plea for the forceps to the after-coming head is made by Staedler (*Archiv für Gynäkologie*, Band xl. Heft 1). He adduces ten cases from Bischoff's clinic, at Basel, of which no mother died; two children died during labor, and two more after labor. Most of the children were born deeply asphyxiated, but revived. In all, Staedler tabulates fifty cases, showing 72 per cent. of living children. He would first try manual extraction, then forceps, last perforation. His cases were chiefly contracted pelves, complicated by cross position.

The Treatment of Occipito-posterior Rotations.

Meyer, of Dorpat, treats posterior rotation of the occiput by combined external and internal manipulation, inserting the whole or portion of the hand within the vagina, while the other hand coöperates by external pressure upon the head. He thus endeavors to rotate the occiput anteriorly, or posteriorly, and holds the head in the most favorable position obtainable until he has applied the forceps. An assistant furthers the endeavors of the operator by pressure upon the trunk through the abdominal walls. Meyer reports three illustrative cases.—*Archiv für Gynäkologie*, Band xl. Heft 1.

Puerperal Eclampsia.

At a recent meeting of the Obstetrical Society of London, Herman reported five cases, and from these and others previously reported by him, summarized the following observations: (1) Four children out of ten died *in utero*. (2) The cases showed no direct effect of the fits on the temperature. (3) In all the cases observed at the beginning of the disease, except two, the quantity of urine was lessened. Of the two exceptions, one died, and in the other renal disease persisted after childbed. (4) In all the excretion of nitrogenous matter in the urine was absolutely diminished, and in most the percentage was diminished. (5) In all the urine was at one time nearly or quite solid with albumin. In three of the cases the fits appeared to increase the amount of albumin. The two cases in which the albuminous precipitate contained the largest proportion of paraglobulin both recovered. Of three in which the amount of paraglobulin was less than in the rest, two died, and in one renal disease persisted. (6) In all that recovered there was rapid increase in the amount of urine and the quantity of nitrogenous matter contained in it, and diminution in the amount of albumin. This restoration did not, as a rule, take place till some hours after the cessation of the fits, and went on more rapidly after delivery in the cases in which the cessation of fits preceded delivery. This restoration of renal function did not take place in the cases

which died. (7) Retinitis was present in only two cases, both of which died.—*British Medical Journal*, 1891, No. 1593, p. 72.

The Hepatic Lesions of Eclampsia.

An addition to our knowledge of the hepatic lesions in eclampsia, of which so much is due to the report of cases by Pilliet, is made in *Bulletins de la Société Anatomique de Paris*, 1891, vol. vi. p. 353, by Papillon and Audain. In the case itself there was nothing of especial rarity among eclamptic cases. Labor was spontaneous; the urine contained albumin, but no bile; the patient died after labor, with icterus and high temperature.

Upon post-mortem examination, multiple ecchymoses of discolored blood were found beneath the capsule of the liver. Microscopic examination of the liver tissue revealed fatty degeneration of the liver-cells with multiple thromboses of the venous radicles, and infiltration with masses of fibrin, the thread-like reticula of which could be traced to the terminations of liver-cells. The hepatic lesions were strongly suggestive of extensive disorganization of the blood.

In discussion, Pilliet confirmed these observations, and added that he had found several sorts of microbes in the livers of eclamptic patients, but none which could be isolated as pathognomonic.

The Poisonous Properties of the Urine during Pregnancy.

A curious and interesting corroboration of the belief that during pregnancy the woman excretes more toxic material than when not pregnant, is found in the result of experiments by Blanc (*Annales de Gynécologie*, 1891, Tome xxxvi. p. 15). He injected the urine of the non-pregnant and pregnant woman into rabbits, and observed the effects. Symptoms of ptomaïne intoxication were more marked when the urine of pregnancy was injected, and basing a comparison upon the body weight of the various animals the ratio of toxicity was 115 to 132, the latter expressing the poisonous properties of the urine of pregnancy.

Twin Pregnancy in a Primipara, followed by Eclampsia; Recovery.

Loviot (*Bulletins et Mémoires de la Société Obstétricale de Paris*, 1891, No. 8) reports the case of a primipara having albuminuria who was found to be in labor with twins. The first child was safely delivered by the application of forceps to the breech; the second was a vertex presentation, delivered by forceps. Both children lived.

Several hours after labor the mother had eclampsia; her paroxysms gradually yielded to treatment. A portion of the vulvo-vaginal tissue became inflamed, and there was high fever. The curette was successfully used to remove the slough, and mercurial solutions were injected into the uterus. Three weeks after labor, the patient suffered from a brief attack of phlebitis. Recovery finally ensued. The most useful measure in the treatment seemed to have been the drainage of the uterus by strips of iodoform gauze.

Secondary Perineorrhaphy during the Puerperal State.

Von Weiss has treated five patients who had sustained extensive laceration of the perineum in former labors by perineorrhaphy shortly after a subsequent confinement. One of the cases had prolapse and ulceration of the cervix. After antiseptic treatment had healed the eroded surfaces, the cervix was replaced and the laceration successfully repaired. The method employed was the flap-operation of Sänger, and the time chosen was as soon as abraded surfaces had healed, and before the patient left her bed. The results were successful.—*Wiener klinische Wochenschrift*, 1891, No. 29.

Elevation of Temperature of Obscure Origin in the Puerperal State.

Coe (*American Journal of Obstetrics*, 1891, No. 6) reports, among others, the case of a patient who had high fever after confinement, without appreciable cause. A mass was finally discovered in the abdomen, and laparotomy on the twenty-fourth day after labor revealed an ovarian abscess containing a drachm of pus, situated deeply among the intestines, shut off by a thick wall from the peritoneal cavity. The appendix vermiformis could not be found, and the condition was thought to be an old appendicitis with intestinal adhesions, in which fresh inflammation followed labor. No puerperal sepsis could be discovered, and nothing abnormal in the pelvis.

Tubal Abortion.

In the *Transactions of the Obstetrical Society of London*, vol. xxxii. p. 342, Sutton describes a case of tubal pregnancy in which rupture of the fœtal membranes occurred after examination. On laparotomy the left tube was found to have been the seat of pregnancy, abortion in the tube having occurred from apoplexy of the ovum. This apoplexy was attended by pain and slight shock.

The Inhalation of Oxygen in Treating Newborn Infants.

Bonnaire (*Bulletins et Mémoires de la Société Obstétricale de Paris*, 1891, No. 6) has obtained good results, in cases of fœtal asphyxia from imperfect heart and in infections destroying the red blood-corpuscle, by inhalation of oxygen.

[In severe broncho-pneumonia of infants with marked cyanosis we have had a similar experience. The dosage depends entirely upon the effect; oxygen may be inhaled until an appreciable result follows, repeated when needed.—Ed.]

Cæsarean Section.

Successful operations are reported by Bar (*Revue Obstétricale et Gynécologique*, 1891, No. 4) for cystic enchondroma of the pubis; by Porak (*Ibid.*) for cancer of the cervix, the patient and child surviving the operation, but the cancer steadily progressing to a fatal result. It is worthy of note that in this case Porak operated before labor began. Cameron (*British Medical*

Journal, 1891, p. 511) has operated nine times successfully, checking hemorrhage by manual compression, closing the uterine wound with silk, with superficial stitches where required. Cameron had one fatal case, a patient who had fallen and had hemorrhage, who died of fatty, dilated heart. GRANGER (*Ibid.*) operated successfully upon a dwarf, using a drainage-tube through the incision and vagina.

CRIMAIL (*Annales de Gynécologie*, 1891, vol. XXXV.) operated successfully a second time upon a rhachitic woman on whom he operated in 1889. The incision was made at the edge of the first uterine wound. The silk sutures of the first operation had been absorbed, leaving only the knots partially imbedded in the uterine tissue.

GYNECOLOGY.

UNDER THE CHARGE OF

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DIVERTICULUM OF THE RECTUM SIMULATING CYST OF THE VAGINAL WALL.

HEYDRICH (*Centralblatt für Gynäkologie*, 1891, No. 21) reports a unique case of this character, in which the correct diagnosis was made before the operation. The patient developed a specific colitis soon after marriage, from which resulted a stricture of the rectum. Ulceration above the point of stricture and inflammation of the cellular tissue between the rectum and vagina followed, and a peri-rectal abscess formed, communicating with the gut; the sac gradually increased in size, causing a protrusion of the posterior vaginal wall, which at length appeared at the vulva, presenting the appearance of an ordinary cyst. The differential diagnosis was extremely difficult, the presence of the stricture being an important aid, as well as the softness and absence of tension noted in the sac. The anterior wall of the sac was incised, a quantity of turbid mucus being evacuated, and its edges were united to those of the vaginal wound. Healing by granulation promptly occurred, after which the stricture was dilated.

PAPILLOMATOUS OVARIAN CYSTOMA.

FRÄNKEL (*Deutsche med. Wochenschrift*, 1891, No. 6) confirms the general opinion that papillomatous ovarian cysts are clinically malignant, since they are prone to metastases, even though anatomically they are not atypical in structure. Their malignancy is shown by the tendency of the papillary masses to penetrate the inner wall of the cyst and spread over its serous covering and thence over the entire surface of the peritoneum. The general thickening of the latter is due to the presence of minute papillary growths, which degenerate to form a viscid fluid. Metastases have been observed in

the pleura, and in one rare instance on the aortic valves. The writer believes that, in the case of the former, papillomatous are to be sharply distinguished from simple glandular cystomata, since the prognosis is so much more grave.

Etiology of Hæmato-salpinx.

Walther (abstract of thesis in *Centralblatt für Gynäkologie*, 1891, No. 21), after careful microscopical studies entertains no doubt of the existence of true hæmato-salpinx independent of tubal gestation. Hemorrhage into the tube may be due to primary salpingitis, to retained menstrual blood resulting from atresiæ and malformations, to catarrh of the tube (which may be caused by an ectopic gestation on the opposite side) or to acute congestion from suppression of the menses or infectious diseases. On comparing true hæmato-salpinx with tubal gestation it is evident that in the case of the former there is more evidence of inflammatory thickening of the serous coat of the tube; moreover, symptoms of localized peritonitis are more marked. The contents of a hæmato-salpinx may be absorbed or may remain unchanged; the blood may escape into the uterine cavity or through the distal end of the tube, gradually forming an hæmatocele; or the sac may rupture, with symptoms of internal bleeding and the rapid development of a hæmatocele. Abdominal section is indicated under all circumstances.

Veit (*Centralblatt für Gynäkologie*, 1891, No. 22) would limit the term hæmato-salpinx to cases in which either the tube is gradually distended by the escape of blood into it, or in which hemorrhage takes place into a previously dilated tube. The latter may be due to torsion of a hydro-salpinx (as in a case reported by Sutton), or more rarely to trauma or neoplasms. An important point in the macroscopical diagnosis of true hæmato-salpinx is the fact that *the distal opening of the tube is closed*, which is not the case in tubal gestation.

[We have called attention to the fact that in true hæmato-salpinx the *entire* tube is apt to be dilated on account of the closure of the distal end, whereas, in tubal gestation the dilatation is confined to a portion of the tube.—H. C. C.]

Anatomy of the Tubes.

Cohn (*Med. Monatsschrift*, 1890, Heft ix.), from independent microscopical studies of sections of normal tubes, has arrived at the following conclusions: 1. The folds in the mucous lining of the tube are more numerous at the uterine than at the abdominal end. 2. These folds increase in number with advancing age. 3. In old subjects the ciliated epithelium disappears, being replaced by non-ciliated columnar or squamous epithelia. 4. The columnar epithelium is often replaced by goblet-cells and by cells with branching processes, which seem to possess a sort of contractile power. 5. There is an entire absence of glands.

Diagnosis of Carcinoma Corporis Uteri.

Hofmeier introduced a discussion of this subject at the recent meeting of the German Gynecological Society. He called attention to the fact that cancer frequently develops from the superficial epithelium, and that under

these circumstances it assumes the alveolar form. The glandular form presents an incipient or adenomatous stage, which persists for some time; later epithelial outgrowths invade and destroy the muscular tissue. The diagnosis of carcinoma can be made microscopically only when the fact of this infiltration of the deeper tissues is established. Hemorrhage (especially after the climacteric) is the initial symptom, sometimes a foul discharge, less frequently colicky pains. The evidence afforded by the bimanual is not positive; the examination of fragments removed by the curette furnishes positive proof of the presence of cancer, and enables the surgeon to decide whether he has to do with the alveolar or glandular variety. It is not sufficient to remove superficial portions of the growth and merely to demonstrate the presence of epithelial clusters in addition to the glandular processes; the invasion of the muscular layers must be noted. The differential diagnosis between carcinoma and malignant adenoma is practically unnecessary. In endometritis there is general and regular hypertrophy of the glands, their columnar epithelium remaining unchanged, while the reverse is the case in carcinoma.

LEOPOLD, continuing the discussion, said that he had examined microscopically seventy-eight cancerous uteri, which had been extirpated *per vaginam*, in twenty-seven the disease being confined to the body. As a result of his studies he had arrived at the following conclusions: 1. Carcinoma uteri, wherever situated, has always an epithelial origin. 2. It is to be described as an atypical epithelial neoplasm. 3. Its most frequent seat is below the level of the os internum, and it originates in the epithelium of the portio, seldom in that lining the cervical canal. 4. Commencing epithelioma of the portio vaginalis is encountered more frequently than has been supposed, and even when apparently springing from the cervical canal its connection with the squamous epithelium of the portio can be demonstrated. 5. In 25 per cent. of the cases of carcinoma of the infra-vaginal cervix the disease extends to the os internum. 6. In cases of carcinoma of the portio the corporeal endometrium is usually hypertrophied. The writer has never observed accompanying sarcomatous degeneration of the endometrium, and rarely adenoma. 7. Isolated cancerous nodules may exist in the corpus uteri in connection with cancer of the cervix. 8. Primary carcinoma of the body of the uterus nearly always assumes the diffuse superficial, seldom the isolated nodular form. The first stage is thickening of the mucosa, followed by glandular proliferation, atypical epithelial outgrowths in the form of tufts and alveoli, and finally invasion and destruction of the muscular layers. 9. The epithelial growth is composed of papillary projections richly supplied with bloodvessels, so that it may be properly described as *carcinoma papillare*. 10. The term "malignant adenoma" is entirely superfluous and misleading, since an adenoma is a benignant neoplasm, and as soon as it becomes atypical—that is, invades the surrounding tissue—it is no longer adenoma, but papillary carcinoma. 11. In the initial stage of the disease the diagnosis may be positively established by the removal of fragments with the curette, in which will be found under the microscope the characteristic glandular proliferation, new formation of vessels, and invasion of the subjacent muscular tissue. When extensive ulceration has occurred, however, the microscopical diagnosis is uncertain, since only necrosed tissue is removed by the curette.

[In this connection *vide* paper on "Adenoma Uteri" in the August number of the JOURNAL.—H. C. C.]

GONORRHŒA IN THE FEMALE.

BUMM (*Centralblatt für Gynäkologie*, 1891, No. 22) thus summarizes the results of his studies of this subject, which extend over a period of ten years:

1. Gonorrhœa in women is a process limited to the superficial layer of the mucosa; the cocci invade the epithelial layer, but are always arrested when they reach the submucosa. The epithelium is originally cast off by reason of the active suppuration, but is quickly renewed, assuming the pavement form; after this change has occurred the active invasion of gonococci is usually arrested, but they continue to grow in the secretion, in which they may persist for months and years.

2. The gonococci have no connection with septic processes; they do indeed cause suppuration of the mucosa, but are destroyed when they reach the subjacent connective tissue. If sepsis develops it must be in consequence of mixed infection; septic germs are frequently present in gonorrhœal pus, and a favorable nidus for the reception of external germs is offered by the purulent genital secretion.

3. The urethra and cervical canal are the favorite seats of gonorrhœal infection; acute gonorrhœa of the cervix gives rise to symptoms only at the outset, but after it has become chronic it may exist for years without causing disturbances, unless it extends to the corpus uteri and thence to the tubes.

The cocci possess no power of spontaneous movement and extend only short distances by proliferation. Extension over larger surfaces must be through the agency of the secretion. Normally the cervical secretion cannot pass the os internum, which also serves as a barrier to the entrance of the specific infection. Menstruation favors the admission of cocci into the uterine cavity, also certain mechanical causes, such as coitus, the introduction of sounds and intra-uterine medication; lastly, this is liable to occur during the puerperium. After they have reached the cavity they again remain stationary, and probably are only carried into the tubes from the causes already mentioned, the puerperium being the most favorable time, as the proximal openings of the tubes are then more patent. In fifty-three patients with gonorrhœa, who were kept under observation for at least five months after the initial symptoms developed, the cervix was infected in 75 per cent., the corpus uteri in 15 per cent., and the tubes in only 3.5 per cent.

WERTHEIM (*Centralblatt für Gynäkologie*, 1891, No. 24) reviews the subject of so called gonococci-peritonitis, the existence of which is denied by Bumm, who affirms that when the cocci come in contact with the peritoneum they are simply encapsulated like any other foreign bodies, the development of peritonitis secondary to gonorrhœa of the tubes being due to mixed infection. Subsequent microscopical studies have shown that the cocci may penetrate the squamous epithelium which covers serous surfaces. Their absence in the exudates of peritonitis is no proof that they may not have originated the inflammatory process prior to their disappearance. After a thorough investigation of the subject, he finds as the result of numerous experiments upon animals that the coccus may, under the same conditions, produce peritonitis

the same as the other pyogenic microörganisms. Now, it may be urged that experiments on animals do not form a reliable basis on which to found a theory as to the development of this form of peritonitis in the human subject; but, as an actual fact, mucous surfaces in the former are less sensitive to the action of the cocci than are those of man, hence in the latter peritonitis would be more likely to occur from contact with them. Not only may the gonococci penetrate squamous epithelium, but they may make their way into the subjacent connective tissue and there enter the lymph-spaces, extending in the same manner as other pyogenic organisms. This is an important fact, since heretofore all inflammations of the deeper tissues accompanying gonorrhœa have been referred to mixed infection; now, peri-urethral abscesses, suppuration of the glands, parametritis, and even oöphoritis, may be regarded as due directly to the influence of the gonococcus. It is a striking fact that no one has ever found any other pyogenic bacterium except the gonococcus in the contents of a pyosalpinx, even though the condition was complicated with extensive inflammatory changes in the tubes, ovaries and peritoneum.

The writer has found the coccus in the pus from sixteen cases of pyosalpinx, but never succeeded in discovering any other form of microörganism, even after the most careful search; there is no reason to infer from this that other bacteria are supplanted by the cocci, since Menge has shown that the former possess a much greater power of resistance than the latter. The writer has also disproved, by numerous culture experiments, Zweifel's assertion that old gonorrhœal pus forms a particularly favorable nidus for pyogenic and septic organisms; the reverse seems to be the case. It seems only fair to limit the term "mixed infection" to those cases in which, after a distinct preceding gonorrhœal infection, the presence of organisms other than gonococci can be demonstrated; of these the writer has seen but two undoubted examples. Abscesses of the ovary may be divided into two classes, according to their etiology—puerperal and gonorrhœal. The former are not uncommon; the *streptococcus pyogenes* is usually found in the pus. That ovarian abscess may be of gonorrhœal origin is proved by a case cited by the writer in which a girl of sixteen had a double pyosalpinx and abscess of both ovaries; in the contents of the right abscess-sac numerous gonococci were found, while the pus from the left one contained no bacteria whatever.

[We recently operated in private upon a child, aged fifteen years, of good family, who had a condition similar to that in the case cited, for which no cause could be found except exposure to cold at a menstrual period. In this case specific infection and puerperal, or traumatic, influences could be absolutely excluded. The pus was extremely acrid, but, unfortunately, was not examined for microörganisms.—H. C. C.]

Ichthyol in the Treatment of Diseases of Women.

Freund (*Berliner klin. Wochenschrift*, 1890, No. 45) speaks highly of this drug in the treatment of endometritis. He first tampons the vaginal fornix with pledgets of cotton saturated with ichthyol in glycerin until the cervix is reduced in size, then applies pure ichthyol-ammonium or -sodium to the inflamed mucosa, the patient being directed to use daily a hot astringent

douche. Usually, after a week of such treatment the hypertrophied endometrium is shrunken, and after the astringent injections have been continued for a short time the affection is entirely cured. In three cases of obstinate recurring corporeal endometritis, in which no result was obtained by curetting, a rapid cure followed the use of intra-uterine applications of pure ichthyol-ammonium.

Fissure of the nipple in nursing women is successfully treated by pencilling the crack with pure ichthyol-zinc after the child has nursed. The pain is quickly relieved, and a cure may be expected in from two to five days.

The Surgical Treatment of Tuberculous Peritonitis.

Kocks (*Centralblatt für Gynäkologie*, 1891, No. 24) operated upon a patient with supposed tuberculous ascites, but found no tubercles on the peritoneum. He raises the question whether ascites may not develop in connection with extra-peritoneal tuberculosis, the effusion being due either to collateral hyperæmia or to the direct irritation of the secreting surface by atoxine. In like manner Löffler's diphtheria bacillus has been shown to be the direct cause of pleural effusions without entering the pleural cavity; also, tuberculous osteitis may cause synovitis, though the fluid from the joint is free from bacilli.

It is inadvisable to completely close the abdomen after performing laparotomy, as it may be necessary to operate again on account of recurrence; in one case the writer performed laparotomy three times. He now invariably leaves the lower angle of the wound open, inserting a drain of iodoform gauze.

Deciduoma.

Under this term, originally suggested by Maier, Sänger (*Centralblatt für Gynäkologie*, 1891, No. 24) includes true decidual sarcoma and not the ordinary neoplasms which have been loosely described under this head. Several cases of so called deciduoma have been reported by Maier, Klotz and Küstner, but a careful study of their descriptions shows that only one of these was a true neoplasm (fibro-adenoma), the other tumors being either mucous polypi or placental moles; one case turned out to be carcinoma. The writer first described true "malignant metastatic deciduoma, or decidual sarcoma" two years ago, since which time Pfeiffer has described one case and referred to three others reported in 1877 by Chiari, who then regarded the condition as carcinoma corporis uteri developing immediately after birth. All five cases presented the same clinical history and terminated fatally within six or seven months after delivery. Anatomically the writer's case differed from the others in the following respects: The growth assumed the form of nodules which originated within the deep muscular tissue and grew inward, forming fungoid excrescences within the uterine cavity, the mucous lining of which was entirely wanting, being replaced by a sort of cicatricial tissue containing small sarcomatous round- and spindle-cells. It thus appeared that while the decidual remains formed the nidus of the neoplasm, they did not possess the power of regenerating the endometrium. Sections of the nodules showed that they were composed of changed decidual cells of a polymorphous char-

acter, imbedded in a well-marked reticulum in which were numerous multinucleated giant-cells. The epithelial cells were arranged in pseudo-alveoli, and there were many dilated veins and localized hemorrhages. Metastatic nodules were found in the lungs, which presented an identical structure, undoubted decidual cells being found.

The term "deciduoma" applied to this neoplasm is incorrect, since it is really a sarcoma, the cells of which assume, by reason of the tissue in which it originates, the decidual type. Gusserow has stated that eleven per cent. of the cases of carcinoma corporis uteri are directly traceable to the influence of the puerperal state, so that it is important to distinguish this condition from "sarcoma deciduo-cellulare." Probably the majority of the cases of carcinosarcoma described by Klebs are clinically and anatomically identical with the neoplasms described by the writer.

As regards the etiology of the growth two facts point to its probable infectious origin—its close resemblance to the *mycosis fungoides* of the skin (described by Rindfleisch), and the presence of a preceding septic endometritis in every reported case of decidual sarcoma. It is highly desirable that the condition should be promptly recognized before metastasis has occurred, as early extirpation of the uterus might result in a radical cure.

The Influence of Castration upon the Ciliated Epithelium of the Uterus.

Krukenberg (*Centralblatt für Gynäkologie*, 1891, No. 22) has made some interesting observations in this direction. While in childhood ciliated epithelium is found only in the tubes and later develops in the uterus, after the climacteric all the ciliated epithelium lining the genital tract is destroyed. As observations upon the living subject are not likely to be conclusive, since the almost constant presence of endometritis before castration would in itself lead to destruction of the cilia, the writer conducted a series of experiments upon rabbits and guinea-pigs, with the following results: Seven months after removal of the ovaries the size of the uterus was not altered and the ciliated epithelium was unchanged; ten months after operation the organ was considerably smaller and the cilia disappeared from the mucous lining of both the uterus and the tubes, showing that there was a direct relation between the uterine atrophy and the disappearance of the cilia. The inference may thus be drawn that castration has precisely the same effect upon the uterus as the climacteric. If the ovaries are removed from a young immature animal the usual development of ciliated epithelium does not occur at all.

Development of Carcinoma in the Cicatrix after Ovariotomy.

Frank (*Prager med. Wochenschrift*, 1891, Nos. 21 and 23) reports two cases of this character observed by himself, and has been able to find but three more in the literature, in which, after removal of a simple myxoid cystoma, the cicatrix became cancerous. Olshausen suggests that in these cases either the cyst was of the mixed form, containing malignant portions, or else that fragments of benignant adenoma were left behind or escaped into the peritoneal cavity, sprouted and underwent cancerous degeneration. The

writer is inclined to explain his cases according to the latter theory, believing that the cells of adenoma bear a close resemblance to those of carcinoma, and may be inoculated upon the healthy peritoneum in the same way. The occurrence of this complication emphasizes the necessity of preventing the entrance of cyst-contents into the peritoneal cavity during operation, since it may lead to serious results.

[We agree with the writer that these cases are probably not so rare as might be inferred from the small number that have been reported. We recall a typical one at the Woman's Hospital.—H. C. C.]

Torsion of a Fibroid Uterus.

Rick (*Prager med. Wochenschrift*, 1891, No. 19) reports the following interesting case: The patient, aged fifty-six years, had complained for a month of severe pain in the abdomen and obstinate constipation, with moderate elevation of temperature. Two weeks before entering the hospital her bowels had not moved for eight days; four days before entrance she had a small movement, and when admitted her abdomen was greatly distended, so that it was impossible to make out anything definitely. She died suddenly the same night while using the bed-pan.

At the autopsy a subperitoneal fibroid larger than a man's head was found, which had a pedicle that had been twisted about its axis from left to right. Closer investigation showed that this pedicle was composed of the elongated uterus, which had made two entire revolutions on itself, the ovaries and tubes being wound around it. On section the tumor was congested, but nowhere necrotic. Several coils of intestine were adherent to the mass, causing obstruction of the gut. Few similar cases have been recorded and the etiology is obscure. The peristaltic movements of the adherent intestines probably had something to do with the torsion. As is known, torsion of the pregnant uterus is a well-recognized complication in veterinary obstetrics.

Primary Sarcoma of the Cervix Uteri.

Kleinschmidt (*Archiv für Gynäkologie*, Band xxxix., Heft 1) in reporting a case of this affection, refers to Winckel's collection of nine cases published in 1883, some of which were of doubtful character. Winckel reported one case of adeno-myxo-sarcoma and one of round-celled sarcoma of the cervix uteri. The author's patient was thirty-six years of age, and applied at the Munich clinic, in 1888, on account of a sanguineous discharge (with some odor) of two weeks' duration, accompanied with sacral pains. A supposed malignant growth was removed from the cervix with the sharp spoon, and its base was cauterized. She had a recurrence, but became pregnant and had a normal labor; ten weeks after a second operation was performed, a soft tumor about the size of an orange being excised from the posterior lip. Five months later it was necessary to curette and cauterize again. On microscopical examination the neoplasm was found to be a spindle-celled sarcoma, which in spots seemed to be carcinomatous.

Of the fourteen cases on record six patients had borne children. The ages of all varied from ten to sixty years. The symptoms were hemorrhage and

foul discharge. Pain was not constant. The symptoms were usually of short duration, seldom over eighteen months. Primary sarcoma is prone to rapid degenerative changes and metastases, especially in the parametric tissues.

The diagnosis is based upon the peculiar whitish, sago-like appearance of the growth and its tendency to break down. It does not tend to extend up into the uterine cavity or to involve the vagina so rapidly as carcinoma of the cervix. The prognosis is bad. As regards treatment, total extirpation of the uterus should be performed if the growth is limited to the cervix, but a recurrence is more apt to occur than with cancer. Temporary relief is afforded by curetting and thorough cauterization.

PÆDIATRICS.

UNDER THE CHARGE OF

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THE IODIDES IN SCROFULOUS CHILDREN.

Iodine and iodoform give better results than the alkaline iodides. To young children tincture of iodine may be given, one drop daily in a little thin porridge made of farina and milk. BESNIER (*Le Bulletin Médical*, 1890, p. 595) prefers the use of iodoform, which may be given continuously for a long time. He prescribes it after the following formula:

℞.—Iodoform . . . . . gr. jss.
Mellis . . . . . ʒiv.—M.

ACUTE PEMPHIGUS IN AN INFANT INFECTING THE MOTHER.

An infant three days old had an attack of acute pemphigus, the palms and soles of the feet being the only parts free. Four days before the bullæ ceased to appear several formed on the breast and forearms of the mother, who always wore short sleeves. These bullæ exactly corresponded in form to those on the child, and they ceased to appear after the infant was cured. There was no suspicion of syphilis.—*Lancet*, 1890, p. 850.

DIAGNOSIS OF TUBERCULAR MENINGITIS IN CHILDREN.

At a recent meeting of the American Pædiatric Association, DR. W. P. NORTHRUP read an interesting paper on this subject. He gave four symptoms which, when they existed together, were to him convincing evidence of the disease—persistent vomiting, irregular pulse, irregular breathing, apathy;

there were also other significant symptoms connected with the organs of special sense. Professor Jacobi agreed with Dr. Northrup in the importance of the persistent vomiting as a diagnostic sign; the vomiting is apt to be marked when the meninges of the base of the brain are the seat of the tubercular deposit; if the tubercular deposit is not marked in this region the vomiting is apt to be less pronounced or absent. Distinction must be made between the cerebral type of vomiting, which is projectile and not accompanied by nausea, and that which is merely reflex or of gastric origin. Dr. Northrup traced the infection in one of his reported cases to the use of tuberculous milk.

Pathogenesis and Treatment of Intestinal Catarrh in Children.

Antiquedad (*Annales de Obstét., Gyn., et Péd.*, 1890) states that the treatment of intestinal catarrh in children is one of the most difficult matters in therapeutics. This is shown by the diversity of methods of treatment, some of which are merely empirical while others are rational. This shows that we must adopt a fixed criterion if we would desire to cure our patients. Treatment has consisted mainly in combating the causes which produce intestinal catarrh and the symptoms which threaten life, without particular reference to the alimentary regimen, which should be adapted to the age and the progressive growth of the child. It should never be forgotten that mothers should be taught that there is no better food for children during the first few months of life than milk, which combines all the elements necessary for growth. The milk must also be of good quality, and if the mother cannot supply it from her own breast it should be supplied by a wet-nurse whose child is of about the same age as the one she is to nurse.

For the fever and the diarrhœa, which constitute the prominent symptoms in intestinal catarrh, the author has found best success in the use of hydrotherapy and sulphate of quinine. For the former he advises general baths once a day, and not more than thirty minutes in duration, of a temperature which shall not be higher than 28° C. nor less than 24° C. The sulphate of quinine is used in solution, one gramme being dissolved in three hundred grammes of alcohol. It is used in the form of fomentations along the vertebral column. The author also found that the diarrhœa could be satisfactorily treated with chlorate of potash, which is eliminated by the mucous membranes. One part of the potash should be dissolved in one hundred of water and combined with ipecac. Small doses of the mixture should be given every quarter of an hour. If this treatment is not efficient, revulsives in the form of thapsia plasters should be used, the plasters being applied upon the abdomen. The conclusions of the author are embodied in the following propositions:

1. A pathogenesis of intestinal catarrh in children has reference mainly to the use of indigestible food.

2. This catarrh is produced when the milk of the child is of improper quality.

3. Cold is frequently the cause of intestinal catarrh in children by suspending perspiration and producing a fluxion in the place of it.

4. Hydro-therapy, sulphate of quinine, chlorate of potash, and revulsion are the means which will be found most efficient in the treatment of intestinal catarrh in children.

Ligation of the Common Carotid Artery, in a Child of Three and a half Years, for Hemorrhage following Peritonsillar Abscess; Recovery.

Parenchymatous inflammation of the tonsil is rare in children. In one thousand cases treated by Sir Morell Mackenzie at the Hospital for Diseases of the Throat (*Pharynx, Larynx, and Trachea*, p. 37), there were only thirty-five cases under ten years of age. Dr. Beverley Robinson (Keating's *Cyclopædia of Diseases of Children*, vol. ii. p. 441), in speaking of the age at which deep-seated inflammation of the tonsil occurs in children, says: "I cannot recall a single instance in which I have seen suppurative tonsillitis in a small child." Dr. Goodhart (*Diseases of Children*, p. 105, quoted by Robinson) reports the case of a girl, six years of age, who, when she came under his care, showed a large, deep ulcer, "which could," he thinks, "only have originated in acute suppuration of the tonsil." A case is reported by Norton (*The Throat and Larynx*, 1875) in which the disease in a little girl, four years of age, terminated fatally from hemorrhage, the abscess having ulcerated into the carotid artery.

Dunn's patient (*University Med. Magazine*, 1891) was the offspring of healthy parents, though there was a decided disposition to tuberculosis in the mother's family. No especial tendency to quinsy, rheumatism, or scrofula and no hæmophilia in the family. The child presented an intense right-sided tonsillitis, the inflammation having extended to the adjacent parts of the pharynx and palate.

On the fourth day the tonsillar abscess ruptured, and for the next seven days the child had six severe and prostrating hemorrhages. The blood was seen to flow between the tonsil and upper part of the posterior palatine fold; a lump now appeared in the submaxillary region which rapidly increased and became a pulsating tumor, two and a half inches in length by one and a half in breadth, extending from the mastoid process beyond the angle of the jaw, and with each pulsation the jaw and head were elevated. The temperature at the time was 101° F., pulse 108, feeble and small. The child was in a drowsy condition, and for several hours had refused nourishment. The nature of the tumefaction appeared to be that of false aneurism, and the necessity for the immediate ligation of the artery was impressed upon the parents.

From the uncertainty of the situation of the bleeding-point and the danger of further loss of blood from opening the tumor, ligation of the common carotid above the omo-hyoid was elected. Careful dissection was made, and in a short time the artery was exposed without injury to any important structure. A catgut ligature was used and the ends cut close to the knot. After introducing catgut drainage, the wound was closed with silk sutures and dressed with iodoform and bichloride gauze. The operation was borne well and with but little loss of blood. What did ooze was of a pale wine-color; in fact, it was so watery that the structures could be seen through the little

pool which formed in the wound. The pulsating tumor previously described decreased in an hour to one-half its former size and in thirty-six hours was the size of an almond.

Before daylight the child took freely of hot milk and stimulants, and at 8 A. M. the temperature was 99°, pulse 96, respiration normal. No difficulty or pain in turning the head. Recovery was rapid and uninterrupted. The wound united without suppuration, and on the eighth day the stitches were removed.

Tetanoid Convulsions in an Infant; Operation; Recovery.

Ronaldson (*Canadian Practitioner*, 1891) recently reported a case that arose when the child was nine days old. It was considered to be one of tetanus, whose starting-point seemed to be the neglected or badly-taken-care-of umbilicus. At first the convulsions were confined to the left side of the body; restlessness led on to tonic muscular contraction, and that was succeeded by well-marked clonic convulsions. Between the attacks the child was apparently well. The convulsions increased to the number of 204 in the twenty-four hours, while during their occurrence the tongue became blue-black, and at times well-marked opisthotonos supervened. On one occasion they were never absent for one whole hour, and for a period of nine hours the child was unable to suck, in consequence of the frequency of the fits. When they did not come too rapidly, it took its nourishment greedily. They varied in frequency from about 100 to 204 in the twenty-four hours, but not in such a way as to warrant us in believing that treatment, local or general, had any beneficial effect.

Dr. Brakenridge, who saw the child, and subsequently confirmed the diagnosis, gave it as his opinion that the convulsions were not due to any disease originating in the brain, but that they were peripheral in their origin, and probably had the umbilicus as their starting-point.

Excision of the umbilicus was performed, and at once there was improvement, and the fits gradually decreased.

They returned later in a lesser degree, but were controlled by sulpho-carbolate of soda, and the child perfectly recovered. Microscopic examination of the excised umbilicus did not detect any special organism in it.

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